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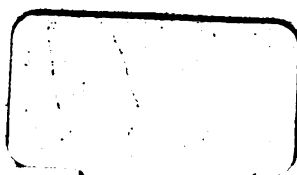
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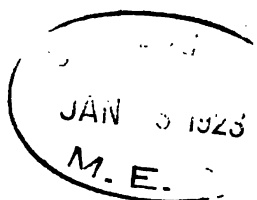
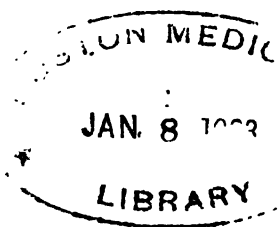
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Original Articles

The Management of Strictures

BY THOMAS C. STELLWAGEN, M.D.

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The object of this paper is to treat of strictures in which the difficulties are great. Liston long ago said "the operation of introducing a catheter through what has been called an impermeable stricture is without doubt the most difficult in the whole range of surgical operations and demands all the prudence, science, and skill of a master."

There is no definite line of demarcation between the easy case and the obstinate one, for the simple uncomplicated stricture may at any time become a lesion of the first import by an accident due to manipulation of instruments or from some cause associated with urinary retention and ulceration of the urethra. Most strictures in their beginning are easily managed and do well under treatment, provided the surgeon does not become too radical. Radicalism in early stricture management oftentimes does great harm. By radicalism we mean cutting operations and methods of rapid dilatation; also other procedures that put an excess of stress upon the urethral mucosa.

The kind of stricture about which we wish to write is the type where the operator has been unable to pass an instrument. They are often termed impermeable, a classification which Sir Henry Thompson long ago criticized as misleading and incorrect, but which is still used by many surgeons. It stands to reason that no stricture is impermeable through which a drop of urine can pass, and inasmuch as urine generally passes they are not im-

permeable. Such a thing as an impermeable stricture can, however, exist; but as a rule has been preceded by rupture of the urethra from external violence or ulceration and internal pressure, which has caused the urinary flow to seek a channel outside its normal canal.

Professor Syme said that whenever urine passes outward through a stricture an instrument ought with care and perseverance to be introduced into the bladder. This doctrine is excellent, and if true, as we know it to have been in his day, should be eminently so to-day. In this era of surgery we have at our command appliances that will assist in the passage of the canal, such as the endoscope, the cystourethroscope, and other perfected instruments of precision. However, I am not in any sense an advocate or believer in some of the procedures that have been suggested for the passage of instruments through strictures. Now and again some one comes forward with a new technique for operation upon stricture in which he claims marvelous things, such as removal of fibrous tissue and conservation of the urethral mucosa. This may be possible, but it has not seemed to me a practical method and is not attempted by a practical surgeon. Every now and again I am asked by some one whether I do so-and-so's operation. My answer is that I follow the beaten path of practical genito-urinary surgery, which does not include the dreams of the surgical

theorist. So much harm can be done and such everlasting suffering can be caused the patient, by impractical methods in urethral surgery that I have not even considered many of the procedures that have from time to time been placed before us.

There are many problems that may cause a stricture to become impassable, among the most common of which are:

1. Extreme contraction of the caliber of the urethra due to shrinkage of the cicatricial tissue.

2. Tortuosity of the canal.

3. Impingement of tumors, abscesses, portions of bone and foreign bodies, such as stones, etc.

4. Reticulation and pocket formation within the urethra.

5. False passages made by instruments or through ulceration, associated as they generally are with fibrous tissue formation.

6. Hypersensitivity of the canal, inducing spasm of the musculature when instrumentation is attempted.

7. Marked eccentricity of the opening upon the face of the stricture, and others unenumerated.

There are several other problems which must always be borne in mind in all cases of stricture. These are of even greater importance than the cause of the trouble, for they are in large measure responsible for the mortality associated with the manipulation and operation.

1. Urethral instrumentation may be followed by a chill that in the feeble or susceptible patient ushers in an attack of urethral fever, eventuating in suppression and death.

2. The innate resiliency of some strictures after manipulation. Thus a passable stricture may become impassable through contraction and bring on complete retention, which through back pressure may cause an imbalance in the secretory function of the kidney.

3. Severe and fatal hemorrhage into the bladder may so call upon the reserve of these frail old subjects as to result fatally.

4. Periurethral phlegmons and other pockets of infection may obtain access to

the blood or lymphatic streams through breaks in the mucosa, and the limiting inflammatory surrounding zones, producing septicemia or pyemia. The pyogenous materials of either a normal urine or more so of an infected urine may be absorbed through abrasions.

The foregoing possibilities must always be borne in mind, and added to them are other accidents that may come. Thus it is that great care and gentleness must ever be the watchword in the handling of strictures.

Given a case of apparently impassable stricture, what course should be followed in its management?

The case should be carefully studied to determine the exact location and kind of stricture one has to deal with. For this purpose a complete history is essential. In it particular attention must be given to the cause of the narrowing. Determine whether it followed a gonorrheal infection or was induced by injury, or the use of some cauterant. How long has it been present? How often does the patient have to urinate? What is the character of the stream? If possible have the patient urinate in your presence so that you may determine this. Does urine trickle from the meatus after the bladder is apparently empty? This symptom is significant of stricture, and is explained by the fact that the urethra dilates behind a stricture, forming a pouch which is drained at the end of micturition.

In most cases it is best to put the patient to bed in order to make a complete study of the case. Of course, there are many instances where this rule does not apply. However, if he is a tender case, liable to chills and other complications, it will be well to have him at rest. It should be a cardinal rule to make a rectal examination by touch before any attempt is made to examine the urethra by instruments; for the case may be complicated by enlarged prostate, abscess, impacted stone, or several other lesions. Again, prostatic disease has often been mistaken for stricture; also it is obvious that in a large prostate, complicating stricture, the operator must use great care

in the selection of his instruments to prevent channeling beneath the prostate if the middle lobe is enlarged. In these cases the formation of a false passage is a very serious complication. After the prostate and posterior structures of the urethra have been examined by rectal touch, the case is prepared for study of the urethra. This, unless there be acute retention demanding immediate relief, is best deferred for a day or two. In the meantime the patient is kept in bed and some form of sedative mixture administered to allay spasm and to prevent, as far as possible, the danger from fever induced by instrumentation. It is my rule to use a combination of bromide of soda, belladonna, and paregoric. If one has faith in urotropin it may be given. Irrigations of boric acid solution gently given may also be of use.

When the urethral examination is to be made the following precautions should be taken:

1. A dose of morphine or opium may do good as a preliminary to instrumental study.

2. Have the patient's legs and chest kept warm by blankets or hot bottles.

3. See that he rests upon a hard mattress that does not allow the pelvis to sag into a depression in the bed. If necessary an ironing board may be placed between the mattress and springs, which will overcome any tendency to sagging.

4. Irrigate the urethra thoroughly by means of warm boric acid or salt solution. Do not use any solution such as potassium permanganate or other astringent medication, for it has been my experience that they cause irritation followed by swelling and congestion, which greatly hampers the passage of the instrument. Permanganate solutions are in general used, but I am satisfied that they hinder the surgeon's efforts in these cases, and in so far as their antiseptic properties are concerned it is my belief that boracic acid or salt solution is quite sufficient for irrigation.

5. Careful sterilization of instruments, parts, and hands is a very essential procedure.

6. All filiforms, Gouleys, and catheters

should be tested for defects before and after boiling. This is most important. Neglect of this precaution has been in my hands responsible for more trouble and failures than any other cause. A word in explanation may not be amiss. The filiform should have its tensile strength tested; it should be examined for rough places that may shale off in slipping the Gouley over it, and above all each filiform after sterilization should pass readily through the eye of each Gouley that is to be used. The eye of each Gouley should be smooth in order to do away with any sharp shoulders that may cut the filiform like a chisel, leaving a portion within the bladder. This accident I have seen far too frequently, and its dangers can be largely overcome by a careful examination both before and after sterilization. It seems needless to insist upon testing the patulousness of all catheters and Gouleys, also the stylets of all metal instruments should be free and efficient. Entrance within the bladder may be unknown on account of inability to draw the urine because of blood-clots blocking the instrument. The stylet will often disengage the clot, thus permitting the urine to flow.

The urethra is filled by a suitable lubricant from meatus to the face of the stricture. Iodoform emulsion in glycerin is very useful and, I think, tends to prevent chill. The lubricant may be gently forced into the narrowed portion of the urethra by pressure exerted from before backward while holding the meatus closed. Wait a few moments before passing the instrument to allow the patient to compose himself. Never hurry in any urethral manipulation in the study of stricture.

We are now ready to pass the first instrument, and the patient is directed to open his mouth and breathe gently and fairly deeply. The arms are extended along the sides and the hands are open. In short have him relax in every way possible, and let your movements and handling of the parts be so gentle as to induce relaxation and confidence. If the surgeon conducts himself otherwise than gently both in manner and manipulation, it will produce a

certain degree of rigidity of muscle in the patient that may defeat the object of the study.

Upon the question of which instrument should be passed first in a case of retention much difference of opinion is held. Of course, if the operator is sure he is dealing with a stricture of small caliber, then the filiform bougie in some form should be used, but if the retention is caused by prostatic involvement a different form of instrument should be selected. The study including the rectal examination should have largely determined this problem before commencing instrumentation. Some surgeons teach that the soft-rubber catheter should be the first instrument inserted into the urethra. This is a point open to argument. The soft-rubber catheter usually can do no harm, but it is obvious that in a small caliber stricture the chances of it passing into the bladder are small. On the other hand the passage of an instrument induces spasm, and this often defeats the surgeon's efforts to pass into the bladder. Hence it is sound judgment to select the instrument that we believe will pass through the coarctation. It is for this reason that I have usually selected the filiform.

While the urethra is distended by the lubricating material a previously selected filiform is entered at the meatus and very gently and slowly passed down the canal until it meets with resistance against the face of the stricture. Then stop and wait a few moments for spasm to relax. Another filiform bougie is now passed down beside the first, and so on until we have a fasciculus of them in the urethra which almost fills its caliber. Each filiform is now manipulated up and down independently of its fellows. Imagine the filiforms as the hub of the wheel—the surgeon must work from as many different angles about the center as the radiating spokes of the wheel. This, of course, is an exaggeration, but the idea of using so many filiforms and working them independently is that in eccentrically placed canals through strictures we will by the above method find that generally one or more filiforms will enter the open-

ing upon the face of the stricture and eventually pass through. The use of filiforms with angular tips and corkscrew turns I have not found necessary, although I believe they have their place. I have a very few times been able to pass a filiform into the anterior opening of a stricture by means of an endoscope, but this procedure I have not found practical; however, it may be tried where the surgeon fails to enter the bladder by the above methods.

Should we fail to enter by the above procedures there are several other things to be done before cutting.

1. Administer an anesthetic if possible and try as above with complete relaxation.

2. I have at times succeeded by allowing a gentle stream of warm water to trickle into the urethra during the filiform manipulation. The warm water tends to relax spasm and often causes a desire for urination, which facilitates passage of the instrument.

When a filiform has passed into the bladder the patient seems to be able to tell and will usually say so. However, the operator by his sense of touch usually determines the fact. If I am fortunate in passing the stricture and into the bladder, unless there be a necessity for catheterization I tie the filiform *in situ* and place the patient at rest for twelve to twenty-four hours before attempting further manipulation. At the next instrumentation I generally succeed in passing another filiform beside the first, and so on upon succeeding days until I have as many passed as the stricture will accommodate. One or more filiforms passed through a stricture into the bladder act as capillary drains and also as dilators. The presence of the instrument at first excites muscular spasm which at times is quite evident, but eventually the muscle becomes tired and the spastic state is succeeded by one of relaxation. Now is the time to determine the particular type of stricture with which we have to deal, and the question of subsequent treatment can be determined.

In a subsequent article I will discuss the operative treatment of stricture.

The Use of Pessaries

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AND

ROBERT E. FRICKE, M.D.

One hears but little of pessaries these days, and relatively few are sold at the instrument makers, yet we believe that the pessary still has a useful if limited field of service.

It is an ancient instrument—how old no one knows; it seems to have been almost instinctive for some sympathetic midwife to try to support a prolapsing womb by shoving something into the vagina, and doubtless from this was slowly evolved the modern pessary, as skill and experience increased, and especially as materials, metals and hard rubber, became available which could be molded and adapted to the ideas of the earlier rude specialist attendant. The name pessary, old as it is, has not always signified only a uterine support, but rather a medicated bolus or suppository, to be inserted into the vagina, as a mode of treatment.

Pessaries in the early days were made of wood, leather dressed and shellacked, and of metal. The advent of soft and hard rubber revolutionized the pessary business, which about seventy-five years ago assumed large proportions. With the increased facilities thus offered of carrying out any doc-

tor's novel ideas of construction a world of new pessaries was launched on a confiding profession. Some men, whom it would not be kind to name, acquired a reputation almost over night by the invention of a new pessary for which great claims of comfort and ability to correct flexions would be advanced. This pessary era of the world was largely innocently fostered by the lever theory of action, adopted from obstetrics, ingeniously explaining how the pessary acted by its crooks and its bars to lift up and straighten an anterior or posterior flexed organ and give relief. It is apparent that before the days of a rational abdominal surgery, when so many female ills were inexplicable, it was a temptation to find some such simple mechanical solution of the knotty problems presented to the as yet untutored mind of the embryo specialist, who was a combination of general practitioner and gynecologist.

There was a pessary much in vogue about a hundred years ago shaped like a bent letter U. Old Professor Hugh Hodge (Fig. 3) took this and united the ends, which kept burying themselves in the tissues, and called it the closed lever pessary;

FIG. 12.

Soft-rubber ring on left, always to be rejected because it becomes so foul. Glass ball in the center, valuable for prolapsus with a fair outlet. Hard-rubber ring on right. This type is better and the hard rubber is best of about same thickness as the soft-rubber pessary shown.

FIG. 11.

FIG. 1.

this, perhaps the best of all, was the progenitor of a vast number of other forms. Albert Smith of Philadelphia narrowed the front end of the Hodge pessary and widened the posterior part, bending it in the form of an S, making the Smith-Hodge pessary (Fig. 4), and his reputation was made, even

surgical specialty, the use of pessaries decreased *pari passu*. I may myself be said to have given a mortal blow to the trade by my suspension operation, treating retroflexions by surgery (*American Journal of Obstetrics*, January, 1887).

As I have intimated above, however, pessaries still have a modest place. What, then, is it? First of all, in the sense of the practitioner of to-day, what can a pessary be used for? I take it that a pessary is not at all used as our forefathers supposed, as a mechanical device to correct a displacement, but that its function is simply to take up a certain amount of slack in the vagina, and to prevent further downward displacement, to keep the uterus from sagging down onto the pelvic floor, and in this way to relieve the dragging sensation. It is likely to be useful therefore in retroflexions with descensus, and for certain cases

FIG. 2. Disc pessary to right, a good substitute for the ring. Menge prolapsus pessary to the left, a type of a very old instrument.

had he accomplished nothing else. T. Gailard Thomas of New York thickened the posterior bar into a sort of hard rubber cushion to help separate the posterior cervix from the fundus, and then we had the Thomas-Smith-Hodge pessary (Figs. 5 and 14)—a good instrument. Paule Mundé took the Thomas invention and broadened the narrow Smith nose, and we then had the Thomas-Smith-Hodge-Mundé pessary. It

FIG. 4. Albert Smith pessary on left. Thomas pessary to right.

of prolapsus, but not in the antelexions so much pessary-treated by a former generation.

The important factor is not flexion but descensus, and the vital question, whether or no a pessary is likely to help the patient, hangs on an examination which determines whether or not she has any decided descensus, and this is best revealed by examining in a standing posture. Again, to be yet more specific, descensus is oftenest found where there is also a relaxed or broken-down vaginal outlet, following childbirth. There is still another fact to be noted, which is an obstacle in the way, for where the vaginal outlet is much broken or gaping it is impossible to make any decent pessary at all stay in. A nulliparous woman who has a retroflexion but a good outlet,

FIG. 3.—Hodge pessary.

sounds ridiculous, but in reality they all had their appropriate places in the gynecological therapy of the day.

It has always seemed to me that the pessary era of gynecology culminated in Grailey Hewitt of England, a typical old-school gynecologist, about forty years ago. As gynecology grew into more of an aggressive

as a rule needs no pessary nor any other local treatment, for her retroflexion is not usually associated with marked downward displacement. However in the exceptional nulliparous case, in which the uterus does actually descend, a pessary is often very helpful; if the discomforts are of a marked character an operation is far better. So, too, if the vaginal outlet is bad it is best to lift it by a good levator ani perineal operation, and at the same time to open the abdomen and to raise the uterus by a staunch round ligament operation, with the addition as a rule of a shortening of the uterosacral ligaments, to provide a niche for the ovaries to rest in, keeping them off

had to devise means to cut the hard rubber in two or more places so as to get the offending instrument out without injuring the soft parts any further. I have always tried to discourage the use of large instru-

FIG. 3.

FIG. 6.

Gehrung pessary on left seen from above as it lies in the vagina, the cervix resting between the bars of the U, convex towards the urethra. The same pessary seen from the side in the right figure.

ments by calling them "horse pessaries." A perforated hard-rubber disc (Figs. 6 and 7) is sometimes better than a ring.

Next to the simple ring for usefulness I esteem the old Hodge pessary (Fig. 3). When in a correct position the anterior bar

FIG. 7.—X-ray of a disc pessary in place taking up the slack of the vagina and preventing any descent of the uterus. This pessary is coated with foil like the one in Fig. 14.

the pelvic floor. Where the outlet is fairly good a pessary often relieves, and the patient either escapes or postpones an operation.

What is the best form of pessary? The most useful of all is the simple ring made of thick rubber (Fig. 1)—reject all thin ones—large enough to stretch the vaginal walls and take up slack, but not to make a tight fit. If too big a pessary is inserted it will surely ulcerate through the vaginal walls into the bladder or into the rectum. Every gynecologist of experience in the old days saw these cases at intervals, and

FIG. 10.—Gehrung upset pessary in place. This is a hard-rubber pessary. The limbs of the U embrace the cervix. The fact that the pessary does not lie symmetrically in the pelvis makes no difference.

must lie easily behind the lower part of the symphysis, with the posterior bar resting behind the cervix. Now the idea of either

of these is not to correct a flexion, or indeed to pay any attention to it at all, but rather to shove up an incipient prolapsing organ.

There is another group of cases in which the anterior wall of the vagina pouts out; then neither the ring nor the Hodge pessary will stay in place. Here an entirely different form is most serviceable; I refer to the

with eversion of anterior and posterior walls and with the cervix at or near the orifice, when there is any kind of a vaginal outlet left to support the instrument, as is not infrequently the case, then one of several pessaries may be used with relief. A simple light glass ball (Figs. 11 and 12) forms an excellent support, but to insure its retention it must offer a little difficulty in the introduction, which takes place with lubrication and a little hard push to get it over the perineum. It is well to caution the patient to use a finger to retain it if it tends to escape during defecation. A big ring pessary made of material two centimeters or more thick sometimes will do good work in prolapsus, but the tendency always is for an edge of the ring to present at the vaginal orifice and then to turn and slip out. This is obviated by interfering with the obvious mechanism of escape by spanning the ring with a bridge with a stem set in the center of it. Menge

FIG. 12.—X-ray of patient with a glass ball pessary slipped through the vaginal outlet, which is but slightly impaired, to prevent prolapsus of vaginal walls and cervix.

Gehring pessary¹ (described in 1873; Figs. 8, 9 and 10). This can be manufactured extemporaneously by taking a hard-rubber ring and holding it in boiling water until it is pliable enough to bend without breaking; one then slowly squeezes two sides together to form an elongate ellipse, and then bends the ends of the ellipse until the sides are parallel and about an inch apart. The still flexible rubber is then transferred to cold water, where it hardens at once and afterwards perfectly retains the new form. I call this an "upset" pessary, as when it is inserted it simply rolls over in the vagina and does not tend to escape. It is worn with the cervix resting between the two limbs of the double U. One ought to have at least three sizes in stock to choose from.

For a well-defined prolapsus of the uterus

FIG. 14.—X-ray of ordinary type of Smith-Thomas pessary in place. The posterior bar lies back of the cervix and the anterior just behind the symphysis. The pessary looks a little larger than normal, as it is encased in foil held in place by rubber plaster.

has devised a pessary (Figs. 2 and 15) of this sort (an old invention) which I sometimes use; his instrument has a detachable stem (bayonet lock), which facilitates its introduction. The *modus operandi* is this: The stem rests in the outlet and on the

¹Gehring, Eugene C.: *The Mechanical Treatment of Cystocele and Prolapsus Uteri*. *Am. Jour. Obstetrics*, 1880, xii, 512-538.

perineum, while the pessary spans the vaginal vault above; now whenever the ring part tends to rotate down towards the outlet the stem impinges on the perineum and prevents further rotation, and so the delivery is checked. Again, let me say it: whatever pessary is used it ought neither to be a tight nor yet a very loose fit; there should be room enough to slip the index-finger easily between the pessary and any part of the vaginal walls.

Is there any danger from the use of pessaries to-day? Yes, very great. Nothing is easier than to convey either syphilis or gonorrhea by inserting a contaminated, unsterilized pessary, and without any doubt this has happened thousands of times, especially in the more distant past, when notions of the methods of the conveyance of infections were not so clear as now. Before use the pessary should be well washed with soap and hot water, and then kept in absolute alcohol for some hours. It is a most reprehensible practice to take a pessary out of a patient and then simply to rinse it and put it away in a drawer, to be taken out subsequently and inserted into another vagina. The wiser practice is to fit the pessary carefully at the first visit, and then to consider it a sort of an individual affair, a piece of personal property, not to be transferred lightly to another woman. Soft-rubber (Fig. 13) and air-inflated pessaries, much in vogue still, ought to be discarded, as they provoke irritating secretions and cause leucorrhea, and are a nasty source of infection. The patient wearing a pessary should use a daily douche of a teaspoonful of table salt dissolved in a pint of hot water. It is not necessary to remove the pessary during menstruation, but it should be taken out once every three

or four months, and left out for several days. A patient wearing one should be kept under a doctor's occasional supervising care.

Sexual life is not impeded except by the more voluminous prolapsus pessaries.

In conclusion, then, the pessary is still of use, often as a temporary expedient, pending operation, or sometimes to test out the question whether an operation by giving support to the uterus is also going to relieve the symptoms. It is also a blessing in the old where an operation is too haz-

FIG. 15.—X-ray of Menge pessary in place. The conical stem is seen with its base under the symphysis, just in the vaginal outlet, while the disc of the pessary rests as shown, seen foreshortened. The white area in the center is the metal locking device.

ardous. A few forms cover all the indications for their use. Great care as to cleanliness is essential to avoid infections. And finally, ninety-nine out of a hundred of the legion once used may be rejected with advantage. A few simple forms meet all indications. The simplest and the best is a plain ring.



Address Presenting Memorial Tablet to Jefferson Medical College, October 7, 1920

BY JOHN CHALMERS DA COSTA, M.D., LL.D.

Samuel D. Gross Professor of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia

In 1914, when the white-robed, gorgeous Spirit of the Spring was scattering pearls and gold on lawn and field and by the roadside, the nations of Europe seemed to be purring on the hearth of Peace. Hindenburg and Ludendorf had not been heard of beyond the borders of Germany. Only the lips of a few Frenchmen breathed the now immortal names of Joffre and Foch. The submarine was thought by the public to be more or less of an experiment, and was supposed by many to be scarcely more than a fancy of Jules Verne. Persons occasionally quoted, and with a sort of tolerant incredulity, the lines of Tennyson:

Saw the heavens fill with commerce, argosies of
magic sails,
Pilots of the purple twilight, dropping down with
costly bales.
Heard the heavens fill with shouting, and there
rain'd a ghastly dew
From the nations' airy navies grappling in the
central blue.

In contrast to this the believers in that widely advertised quack remedy, The Hague Tribunal, also quoted Tennyson, with confident belief:

Till the war-drum throb'd no longer, and the
battle flags were furled
In the Parliament of man, the Federation of the
world.

It is true that France was the seat of great economic unrest and that her socialists were active in the congenial task of reducing the army. That the dull, brutish masses of the vast dominions of the Romanoff Czar were becoming articulate in portentous words and acts. That the embers of discontent in Ireland threatened to flame into actual revolution. That in America various groups of sentimental busybodies were striving to destroy the carefully laid foundations of truly free, genuinely democratic, constitutional government. That Germany, with glaring eyes and buffalo strength, was trampling down all obstacles

on the path which leads to the goal of commercial and industrial supremacy. But statesmen and diplomats other than Germans failed to see in the heavens a blood-red comet presaging the impending conflict.¹

Toward the end of June a mighty fleet of British war-ships paid a visit of amity to Kiel. The welcome extended by the German fleet seemed cordial and spontaneous. The Kaiser was visited by and visited in return Vice-Admiral Sir George Warrender. The sailormen of the two fleets celebrated and fraternized boisterously and alcoholically on shore. During the maneuvers a monstrous German Zeppelin sailed lazily over the visiting fleet. Messages of good-will were thrown down by its crew to the visitors. Beyond doubt the appearance of an English superdreadnaught, viewed from the sky, was noted with scrupulous and photographic accuracy. "Coming events cast their shadows before."

All persons present, except Germans, were convinced that the old enmity between England and Germany was at last ended, that friendship was secured, and that looming gladly in the near future was an Anglo-German understanding.

At this time Lord Haldane, the Scotchman at the head of the British War Office, was proclaiming that Germany was "the land of his soul." But the German war party, which was represented by German Officialdom, had very different beliefs, and was brooding out vastly different plans. The final touches were being put to that colossal and marvelous war machine so that it might be ready in all particulars for "The Day," dreamed of so persistently and longed for so ardently. When "The Day" should come, and it was dreadfully near,

¹Many of the statements which follow were taken from Frederick William Wile's valuable book, "The Assault."

the war machine was expected to crush into annihilation the liberties of the entire world. And it almost succeeded in doing so. Had it not been for the United States it would have done so. It failed by the breadth of a hair.

During June a German commission, every man of which was an expert on guns or ammunition, visited England and was received by British officials. Herr Krupp von Bohlen und Holbach, of the great gun company in Essen, was a member of the commission. With a fatuity which now seems incomprehensible the English hosts showed the German guests everything. There were no secrets from those privileged visitors. They were given a complete exposition of where war material was made, of how it was made, of how much of it was made, and of how much of it could be made under stress of necessity. At the same time Dr. Dernberg (the same Doctor who later left so unsavory a trail in the United States) was in London, and he was shown by representatives of the British government the most confidential governmental details, financial, economic, and industrial; Herr Balin, the head of the great Hamburg-American lines of ocean steamers, was investigating the British merchant marine; and Grand-Admiral Prince Henry of Prussia, in intervals between dinners, balls, and receptions, was examining immensely important and supposedly secret records of the English navy. Germany did not have to stack the cards. England handed her cheerfully most of the trumps before the game began. That Germany knew with certainty what was coming and was preparing for it carefully is shown by the following statement of fact: On the second of June, 1914, the military governor of German Southwest Africa sent most of his officers home to Germany on leave. Kismet! it was written.

On the 28th of June the Archduke Franz Ferdinand, heir apparent to the throne of the House of Hapsburg, was assassinated in Serbia, and "the red name of Sarajevo splashed upon the pages of history." Events moved with deadly rapidity. The Austro-

Hungarian ultimatum, the Austro-Hungarian war upon Serbia, and mobilization of the troops of Germany and Russia.

Sunday, August 2, Germany declared war upon France and Russia. At midnight on August 4, the English ultimatum to Berlin expired and the British Empire became automatically at war with Germany. The awful tragedy, the crime of the ages, was at once in bloody progress.

The dark chancery of fiends promptly let loose all the hosts of Satan. Soon what a frightful inferno of horror was displayed to shocked mankind. Demons rejoiced and angels wept. Belgium raped and harried! Northern France blood-stained and desolated! Once prosperous cities piles of ashes! Holy cathedrals, sanctified by the faith of a thousand years, heaps of ruins! Great and ancient seats of learning wiped from the face of the earth! Fields which should have been nodding with abundant harvests, torn by great explosive shells into "lunar landscapes," and gleaned only by the reaper Death! Wolves gathering from the forests! Vultures flocking from the air! Women ravished and executed! Children mutilated! Men slaughtered by myriads! Civilization palsied! Christianity impotent until some cried in Kipling's words:

"I can find no ease
In your pale Christ and tangled trinities!"

The Huns rode as masters upon this awful whirlwind of their own creation. They made a desert and called it Peace. They asphyxiated with vapor. They poisoned with gas. They slew with liquid fire. They cast down sudden death from the skies, and, by means of the submarine, that deadly cobra of the sea, they struck and sunk great ocean liners, filled with non-combatant men and innocent women and children.

Truly the world looked upon the worst of all possible spectacles, the strength of civilization without its mercy. In order to satisfy the insane arrogance, vanity, and ambition of a wretched and stupid Hohenzollern, William the Damned, men from Asian Kiau-Chau to the Atlantic Ocean and

from Archangel to South Africa cut each other's throats.

Our government, with the support of all political parties, strove long, honestly, and with unequaled patience to be strictly neutral. Outrage followed outrage. Infamy trod upon the heels of infamy. Again and again the Kaiser promised to comply with our just demands. Again and again he broke his solemn pledges. We learned the bitter truth of Strafford's plaint, "put not your trust in Princes."

Finally, in spite of a positive promise to the contrary, Germany renewed submarine warfare on neutrals. The Emperor said he would "stand no more nonsense from the United States." And he did not have to stand anything resembling nonsense from the United States. He got instead the most magnificent, forceful, and irresistible good sense. The President cast down before the world a historic message, a message as radiant as though it were traced in words of living light. In that message he made answer to German pretensions, assumptions, and exactions with a glorious and everlasting "No!" The Nation rose to the support of the Chief Executive. We declared war on Germany. We stood shoulder to shoulder with France, England, Italy, and Belgium. The United States was soon arrayed in the proud panoply war. All classes went to the colors. Most men wore the khaki, but many wore my own beloved naval blue. Sons of millionaires became comrades of youths from the Ghettos of our great cities. The blacksmith became the "buddy" of the lawyer, the farm-hand of the merchant, the miner of the secretary, the cowboy of the clerk. Men by the million were collected and trained in immense camps and were sent across the storm-swept, mist-shrouded, submarine-infested waters of the North Atlantic.

Then came the red and roaring line of battle, our fight of 47 days, and those names enshrined forever in the Holy of Holies of our history—Chateau Thierry, St. Mihiel, the Meuse, Belleau Wood, the Argonne; our 34,249 killed in battle; our 224,069 wounded, of whom 13,691 died;

the armistice, peace, and the exile to a Holland chateau of the cursed author of all the horrors, where he practices "the set, gray life," and will reach "the apathetic end." A ghastly and pathetic figure of retribution. In the Civil War, lasting over four years, there were, on the Union side, 44,238 killed in battle, 246,712 were wounded, and of these 31,978 died. In the world war nearly 35,000 were killed in 47 days; in the Civil War nearly 45,000 were killed in four years.

The desperate evil William inaugurated is still breeding its foul brood. In the words of Ecclesiastes: "All iniquity is like a two-edged sword; there is no remedy for the evil thereof."

"So many sorrows in so many lands,
So many streaming eyes and wringing hands."

Life on the old lines is done forever. We walk untrodden ways. We have left the Land of Certainty and sail the waves of Chance. Some Catos of the club dictate our policy. The world has become educated, sober, respectable, and horribly unhappy. Everywhere we meet with unrest and discontent. We treat this condition with entire imbecility. We consult few persons; but governmental quacks. When resentment is actually flaming at arbitrary abbreviations of our liberty we meet the perilous situation by curtailing more of our liberty. Individualism puts forth claims and is met by shrieks for efficiency, the very antithesis of individualism and the real father of degeneration. For 25 years neither Congress nor a State legislature has passed a single act to broaden our liberties, and Congress and legislatures have passed many acts to limit and restrict them. All major crimes are enormously on the increase. Only petty offenses diminish. Real righteousness seems to have gone down to a great degree before meaningless convention. Many modern reforms to succeed would require as a basis the total repeal of human nature. The contagion of delusion sweeps over the entire earth. The proletariat is in the saddle. Drivers of milk wagons are paid more than professors of philosophy. The average bricklayer ob-

tains greater financial reward than the average physician. Callosities on the palms command more money and more respect than convolutions of gray matter. Blacksmiths rank higher than scientists, and therefore Andaman Islanders must rank higher than psychiatrists. The church house is not nearly so wide open as the station house. It is financial wisdom to advocate the popular error. The frenzies of fashion madden great classes. Hate and envy are twin monsters unrestrained and gaining hourly in strength and ferocity. Tainted persons attain high office. Moral indignation can no longer gather irresistible strength. Character is vilely adulterated. The sense of personal responsibility seems to have been lost absolutely. Many a crooked business deal is regarded as a piece of admirable finesse. Inclination poisons duty. There is no respect for experience or common sense. Every demagogue has his followers, every fool his partisans. The air resounds with the brays of those who follow various osophies and isms. Great masses have entered into the labyrinth of mysticism and regard the Almighty God merely as a sort of President of a Board of Directors. Logic has departed from thought and reason from action. We see before us, grisly and menacing, the horrid figure of religious persecution.

"These giant hopes, these towering schemes,

"Conceived beneath a blood-red star,

"These frantic feuds and nightmare dreams,

"I know them for the things they are."

Yet we Americans must not under any circumstance let the sacrifices of the war be rendered vain. We must fight to the death these evil tendencies. We must not abandon hope. We must ever look

With a poet's eager eye
Spite of critics scorning,
For the rosy bow of Hope
On the grey of morning.

It must never be said in history that our brave fellows died in vain. I know their young souls counsel us not to despair.

"No man to nurse despair;

"But in the teeth of clenched antagonisms

"To follow the worthiest till he die."

No class responded to the call to arms more nobly than physicians. When the war started there were but 500 officers in the medical corps of the army. When the armistice was declared there were over 30,000. In other words, during the war 98.3 per cent of the officers of the medical corps came direct from civil life (George Emerson Brewer). The same was true relatively of the medical corps of the navy. Most of these doctors from civil life gave up practices made or in the making, abandoned hard-won positions, cast aside irrecoverable opportunities, and in not a few instances left families in poverty with scarcely means enough to provide food and lodging. Many wives and daughters had to go to work when the breadwinner had departed.

Most army doctors returned when peace was attained. Some returned to their old places and former prosperity. Not a few came back to find their positions filled, their practices lost, their former rivals living in abundance. How could any person dare to do such things to soldiers? He could not if we remembered the words of that splendid physician and prince of gentlemen, the late Lieut.-Colonel John McCrae, the brother of our own distinguished Professor of the Practice of Medicine. Colonel McCrae lost his life in Flanders serving with that magnificent corps, the Canadians. He wrote:

"To you from failing hands we throw

"The torch; be yours to hold it high.

"If ye break faith with us who die-

"We shall not sleep, though poppies grow

"In Flanders fields."

Many never returned. Some were lost at sea. Some were killed in action. Some died of gas or wounds. Some perished of disease in camp or hospital. All of them alike entered the dark portals of eternity in patriotic service to the nation.

The sons of no institution in the land responded more splendidly than those of Jefferson. Such has always been our habit. Ever since our foundation the inexorable messenger of Death has found sons of

Jefferson on all the battlefields of the Republic.

We have about 5000 living graduates. One thousand two hundred and sixty-eight of them entered the army; one hundred and sixty-seven of them entered the navy—a total of 1435. The College was represented in the services by men from every State and from all the foreign possessions of the United States. Classes were represented as far back as 1862, 1870, and 1872. From 1875 to 1918 inclusive, every class was represented. Sixty-five per cent of our graduates for the five years preceding 1918 served in the army or navy. The class of 1916 had a larger number of men in the service than any other class—103. The class of 1917 had 94. The class of 1918 had 91.

The Student Army Training Corps was not counted with the 1435 cited as in the service. That corps numbered 431 men sworn into the service—398 in the army and 33 in the navy.

The Jefferson Hospital Unit, which went to France, was equipped at a cost of \$210,000 and was composed of 34 physicians, 100 nurses, 5 civilians, and 200 enlisted men. Seventy-five graduates of our training school for nurses went to war, served nobly, faced danger heroically, stood hardship without complaint. I take off my hat in admiration to all those brave and gentle women.

Many of our graduates were given citations or were decorated by foreign governments. I have a list of 27 of them, and the list is far from complete. One got the Order of the Bath; 3 Officier of the Legion d'Honneur; 1 the Belgian War Cross; 2 the Croix de Guerre; 5 the Distinguished Service Medal; 12 the British Military Cross. Morgan, a former resident of this hospital, is one of our Legion of Honor men. Petty of this hospital received the

well-merited, seldom given, and magnificent honor of the Congressional Medal. Only 54 men live who received this decoration. Major W. W. Keen, the Emeritus Professor of Surgery, was decorated as Officer of the Order of the Crown of Belgium.

We know of five who were seriously wounded, viz.: Beck of New York; Berney of Scranton; Fogerty of Philadelphia; King of New Jersey; McCutcheon of Virginia.

Twenty-six passed to the bosom of eternity. Seven were killed in action; two were lost at sea; seventeen died, just as truly for their country, in camp or hospital. The classes which hold upon their rolls the sacred names of our dead are '89, '92, '02, '06, '07, '08, '10, '11, '12, '13, '14, '15, '16, '17, '18. I had the high privilege as Assistant Demonstrator, Quiz Master, Demonstrator, or Professor, of teaching every one of these men who died for the nation.

We will always hold them in sacred memory, and also the names of the places where they died. They died to save us. Wherever man has died for man that spot is holy ground. It is proper that names of our heroes should be commemorated. The Alumni Association decided that their names should be placed on a tablet, and that the tablet should be hung in the halls that those soldier and sailor surgeons knew so well and loved so much. In consummation of the design of the Alumni this tablet has been made. In the name of the Alumni I present it to the College.

It will always be upon our walls. Generations of students yet unborn will look upon it. It will touch our hearts, stir our patriotism, read us a lesson of heroic duty, thrill our souls, and raise us to higher deeds and nobler aspirations, to think of those brave and gallant gentlemen who made the final sacrifice to save the nation.

Dulce et decorum pro patria mori.



Vaccine and Gland Therapy in Various Disorders¹

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I shall give in this paper only a brief résumé of the conclusions drawn from the results in treating 4686 cases of all kinds, mostly chronic, in the Torbett Sanatorium, from January 1, 1919, to August 1, 1920, thus avoiding the long, tedious details of each individual case. Of this number 27.7 per cent gave a history of having had during the first or second epidemic a more or less severe case of influenza, which was considered to be one of the causative or exciting factors in the ailments for which the patient sought relief. Many patients would start their history by saying, "Well, I had the 'flu' and have never felt right since." Some cases were so mild they never went to bed. On the other hand I have seen several patients apparently cured of existing troubles by an attack of influenza. Many more cases, however, claimed an exacerbation of their previous chronic complaints following a slow convalescence from the respiratory infection they called the influenza.

In August, 1918, we began using the vaccines as a prophylactic, but soon used them as a treatment even with a fever of 104°, if a leucopenia or polymorphopenia was found present. In approximately three hundred acute cases of influenza in the first epidemic we had but two fatalities—one an invalid to start with who was given the vaccines, and the other a lady, pregnant five months, with both lungs involved and seen first on the fourth day. The bicarbonate or citrate of sodium was given alternately with fruit juices to insure the normal blood alkalinity which we think promotes the needed leucocytosis.

About six hundred of our cases were venereal, with or without influenza as a complication, and they were all treated along the special lines for those troubles. All cases which would or could submit were first examined physically from their head

to their feet, by two or three different physicians in different departments, together with a complete blood, urine, and fluoroscopic examination—the Wassermann and other tests being added if the physical examination or clinical history indicated the necessity for such. The symptoms of hypo- or hyper-activity of the thyroid and other glands of internal secretion were looked for. Of course, all foci of infection were sought and removed from the teeth to the toe-nails, as infected ingrowing toe-nails or an ulcerated navel were occasionally found as the causative factors. In very few patients could one factor alone be assigned as the sole cause of ill health. Of course, a large percentage of all chronic cases have more or less pyorrhea, which may be a potent causative factor, but the writer has for years believed this to be a local manifestation of an imperfect systemic elimination, a one-sided diet, and oral uncleanness.

Infected tonsils were considered to be a probable cause and removed in about 25 per cent of all our cases, followed by a prompt recovery in many and a slower recovery in others, after general treatments by elimination, etc., mentioned below. Infected sinuses, as shown by the late methods of transillumination, were found more frequently than heretofore thought. Glycerin and ichthyol tampons, locally applied, with operative procedures often to procure better drainage or breathing space, gave satisfactory results.

Since 27 per cent of our cases gave a history of influenza that might have lighted up or caused the sinus and tonsil infections, we found of course a large percentage of pulmonic infection as shown by the râles, cough, prolonged expiration, etc., and a peculiar diffuse haziness as shown by the fluoroscope. Our x-ray man by this alone would often tell the patient of the previous attack of influenza. This observation has been confirmed by several men of large

¹Read before the American Electro-Therapeutic Association, Atlantic City, Sept. 18, 1920.

experience. Our observations, however, are in harmony with Fishburg's in his recent article in the *American Review of Tuberculosis*, November, 1919, in which he states that influenza was not so common nor severe in tuberculous patients as in others; neither was it a reactivator of healed or latent cases. Our patients who coughed showed in their sputa staphylococci, streptococci, and pneumococci, with but few tubercle bacilli. A large percentage of these cases with pulmonic infection, as well as many others, showed a decided leucopenia, being about evenly divided between cases of latent or active malaria and post-influenza toxemias. Many American and foreign authorities found leucopenia present during the active stage when there was no active pneumonia or empyema. Bache of Sweden in a recent article mentions this fact, and further says that if a decided leucocytosis occurred when complications like pneumonia arose, recovery was much more prompt. Most of the chronic pulmonic sequelæ we saw had also migratory myalgia, and some form of neuralgia, neuritis, or arthritis.

A large percentage last year and a still larger one this year showed what is commonly called a lymphocytosis, but which we prefer to call a polymorphopenia, in which the polymorphonuclears were less than 60 per cent and often down to 25 or 30 per cent. They are the phagocytes.

The writer considers this of more importance in chronic low-grade infections, because the polymorphonuclear cells are most concerned in the destruction of systemic bacteria, and hence a polymorphopenia would seem to indicate an exhausted condition of the leucocytic hemopoietic tissues. A review by the writer of hundreds of blood counts made on all classes of chronic cases at the Battle Creek Sanitarium showed a polymorphopenia last year in 23 per cent of all cases and in 27 per cent of all cases this year, regardless of whether they had been affected with influenza. In our clinics the number never exceeds more than 20 per cent at any time. Many of these cases complained only of vague mi-

gratory myalgic or neuralgic pains with a decided loss of "pép" or energy.

In all acute cases with fever like influenza, pneumonia, cholecystitis, arthritis, etc., where the leucocytes were not in a ratio of 1000 above 10,000 for each polymorphonuclear above 75 according to Gibson's table, a mixed polyvalent vaccine—usually Rosenow's mixed influenza and pneumococcic—was given, the dose being repeated according to reaction of the flesh and also the blood picture. In some cases not reacting phylacogen was used intravenously. Radiant heat and light were used every four hours over the inflamed parts if possible; while often liniment of menthol, camphor, and iodine in vaselin, or petroleum, was gently rubbed in for its local and systemic effect. In most cases the leucocytes were increased two or three-fold in three hours with prompt improvement. In all chronic cases with pulmonic, rheumatic, or neuralgic symptoms which had leucopenia or polymorphopenia, one-half-grain doses of iron cacodylate were given when the hemoglobin and red cells were low, and three-grain doses of the cacodylate of soda when they were not so low, in addition to the vaccines. The soda was always given in the veins. The usual general eliminative, physiotherapy, and dietetic treatments were of course given.

The blood picture and the patient's feelings usually became normal or very much improved in three or four weeks. Jobling and Peterson, Culver, and many other authorities too numerous to mention have shown that vaccines and foreign proteins increase the leucocytes. Horace Greeley in the *Medical Record* of October 11, 1919, shows that there is protective immunity obtained by influenza vaccines. E. C. Rosenow in several articles, the last one in the *Illinois Medical Journal*, March, 1920, claims a protective immunity in 60 to 80 per cent of all cases vaccinated. We used vaccine in both acute and chronic cases because of their known effect on the leucocytes and for the additional effect of securing whatever immunity might be obtained. H. W. Watters in the *Boston Medical and*

Surgical Journal, December 25, 1919, also Duval and Harris in the *Journal of Immunology*, September, 1919, all confirm the protective immunizing properties of a mixed influenza vaccine which lasts from three to five weeks up to several months in some cases. Duval and Harris claim that chloroform is superior to other agents as a vaccine preservative.

Many chronic cases if examined closely will be found to have hypo- or hyperactivity of one or more glands of internal secretion given a gland disharmony. Whether it be due to a one-sided diet, imperfect elimination or a postinfluenza or other toxemia, the proper gland given will greatly aid in restoring health. The dry skin, reduced endurance of cold, lowered tolerance of meat, slowed pulse, dry, falling hair call for thyroid gland, and if constipation, or a boggy uterus with profuse menstruation, be added, pituitrin should also be given. Ovarian substance should be given girls with amenorrhea along with the iron or sodium cacodylate, and also for the nervousness and hot flashes of the climacteric. The mammary extract is useful for girls with profuse menstruation and small undeveloped breasts, also for the same state in women at the climacteric, with pituitrin added if fibroids be suspected.

In addition to the above aids, a brief résumé of the general treatments or rational therapy given all chronic and many acute and subacute cases might be of interest. At least half of all our chronic cases have a chronic spastic constipation, often of the nervous or habit type, but usually accompanied by a catarrhal or ulcerative colitis which can be the source or cause of systemic toxemias from skin troubles, neurasthenia, or rheumatic conditions to Bright's disease.

CONCLUSIONS.

First: Find and remove if possible all foci of infection, which was found in some form in slightly more than 50 per cent of our cases.

Second: Promote elimination through the bowels, kidneys, skin, and lungs by the

use of modern physiotherapy, air, food, drink, baths, and medicines occasionally.

Third: Immunity. Use specific or polyvalent vaccines when leucopenia or polymorphopenia is present.

Fourth: Specific chemotherapy. Use quinine and arsenic for malaria; "606," mercury, and iodine for syphilis, antitoxin for diphtheria; also the gland substances for the various conditions requiring them.

Fifth: Alternate exercise, rest and sleep. Use work and play, walking, physical culture, auto massage, Morton wave, sinusoidal electricity, hot and cold douches, or spray, with regular hours for sleep in a dark, well-ventilated room.

Sixth: Food and nutrition. Use a balanced ration of not more than four or five kinds of food at each meal, usually the low protein dietary, with green vegetables and fruits, and always a slight preponderance of the alkaline bases over the acid radicals, remembering that meat and bread give acids, while most fruits and vegetables and milk give alkaline bases to the blood.

Seventh: Psychotherapy, mental therapy, suggestion, Christian science, prayer-and-faith cure, fun and jokes, optimism should one or all be used to banish worry, arouse hope, renew one's courage and the desire to live, and are of value according to the operator using them.

Benzyl Benzoate in Circulatory Conditions.

In the *New York Medical Journal* of August 28, 1920, MACHT states that he has found few cases of high blood-pressure in which that condition was not relieved, at least temporarily, by benzyl benzoate. Most of the cases treated with the drug were ambulant patients who attended to their daily occupations while taking the drug while all the other conditions were the same. The only difference being the taking of benzyl benzoate, the effect of the drug in reducing the blood-pressure was indisputable. In most of the patients the reduction of the blood-pressure was accompanied by an improvement in their general

condition. Thus, patients who complained of precordial pain or oppression showed decided improvement in that respect.

The most convenient and effective form of administration of the drug was found to be the one originally used in his earlier experiments. A twenty-per-cent alcoholic solution of benzyl benzoate was administered by mouth, either in cold water or milk. The ordinary dose was found to be twenty or thirty drops of such a solution, taken three or four times a day. The administration of benzyl benzoate in the form of a solution was found to be especially useful because it allowed of a convenient reduction of the dose whenever desirable. Macht found that after administering to a patient full doses of benzyl benzoate and obtaining a desirable therapeutic effect, the reduced pressure could be maintained by keeping a patient on very small doses of the drug, sometimes no more than five minims of the twenty-per-cent solution.

The effect of benzyl benzoate on the blood-pressure was demonstrable even in such cases in which nitrites failed to produce a vasodilatation. Thus, he has been able to reduce a high blood-pressure in patients who have become habituated to nitroglycerin and sodium nitrite. The onset of the benzyl effect, however, is not as rapid as in the case of nitrites, although sometimes the vasodilator effect was appreciable within thirty minutes. The duration of the benzyl effect, on the other hand, was much longer than that in the case of the nitrites, with the possible exception of erythrol tetranitrate. The blood-pressure sometimes remained at a low level for several days after discontinuing the drug.

In his experience no toxic effects have been noted after administration of benzyl benzoate by mouth. The drug has been given to some patients repeatedly for periods of over a year or more, without producing any untoward symptoms. So far as he has been able to ascertain from examinations of urine and functional tests of the kidneys, benzyl benzoate does no harm to the latter organs, and may therefore be

administered, if desired, to patients suffering from nephritis.

As in the case of nitrites, however, the writer has noted after observations extending over a period of more than two years that patients will become habituated to benzyl benzoate and will not react as promptly to it as at the beginning of the treatment. Such patients, however, were generally of the nephritic type, whose condition was expected to become aggravated in the course of time.

While benzyl benzoate acts as a vasodilator and will therefore reduce excessively high blood-pressure, the indications for its clinical use are precisely the same as for the use of other vasodilators, such as the nitrites. Its action is a purely symptomatic one, that is, in reducing the blood-pressure. It is of course well known that a reduction of the blood-pressure in many cases of renal disease and other conditions is not indicated and may even be harmful. In such cases, of course, benzyl benzoate is not to be used any more than nitroglycerin or sodium nitrite.

Macht has not only noted a beneficial effect following the use of benzyl benzoate in patients with hypertension who suffer more or less from precordial pain, but he has also given the drug successfully in a few cases of angina pectoris. If, as is generally supposed, anginal attacks are due to paroxysmal spasm of the coronary arteries, the favorable effects of benzyl benzoate may be explained by its vasodilator action on those vessels. Spach, of Chicago, collected a series of such cases. The pharmacological action of benzyl benzoate certainly warrants a more extensive trial of that drug in the treatment of this condition. The best method of employing it would seem to be to administer it between the acute anginal attacks. For the acute attacks the effect of benzyl benzoate by mouth would be too slow, and in order to relieve the patient it would either have to be given by subcutaneous injection in oil or, still better, the attack should be combated with a whiff of amyl nitrite.

Editorial

THE VALUE OF GLUCOSE BY RECTUM.

For many years it has been the custom of medical men in cases of obstinate vomiting, or in other conditions where food could not be taken by the stomach, to administer so-called nutrient enemata. With the advances made in the use of digestives it has been customary during the last thirty or forty years to predigest, by the aid of pancreatin, milk or other animal food prior to its rectal injection, with the idea of providing the body with nutritive material which would be readily absorbed. It is well known, of course, that the rectum is a part of the alimentary canal which is not designed for absorption, and we think it has been the experience of most clinicians that while the fluids given in the enemata to which we have referred are absorbed, the solids are not absorbed, and hours or days after are passed from the bowel. In other words, the patient who receives a predigested nutrient enema, consisting largely of proteids, gains very little over and above that which would ensue if plain water or a weak saline solution was employed. The body is supplied with fluid, but the physician and patient are deluded if they believe that the patient is being truly nourished.

Researches carried out by Edsall and others some years ago prove the correctness of this view. They were not content alone with studying the material which was ultimately extruded from the bowel, but by careful studies in the realm of physiological chemistry showed fairly conclusively that the patient, under the conditions which we have described, was in reality living on his own tissues, although material advantage of course accrued from the supply of fluid.

These facts being true it is natural that the profession should have turned to other methods with the hope that something might be found of nutritive value which

would be absorbed from a rectal injection, and as a result glucose or dextrose, or other saccharides nearly related thereto, have been administered in many instances with some advantage. But comparatively little work has been done to determine whether a sufficient quantity of the carbohydrate substance is absorbed to be of real nutritional value.

Ornstein, using dogs for a series of experiments and employing a washing-out method some time after a glucose injection was given, seemed to show that some absorption took place, and it is interesting to note that he found that if the glucose was given in starch it was better absorbed than if given alone.

Nagel as long ago as 1909 called attention to the fact that glucose was so absorbed, and his observations have been confirmed by a number of others, notably Schönborn, who stated that a glycosuria could be produced if glucose was given freely by the rectum.

More recently this subject has been carefully reported upon by Tallerman of the Department of Chemical Pathology in St. Thomas's Hospital, London, who has contributed a paper to the *Quarterly Journal of Medicine*. He quotes Reach as having shown as long ago as 1902 that the change in the respiratory quotient following rectal injections of glucose indicated that this substance was slowly absorbed. It appeared to Tallerman that the work so far carried out upon animals and man was insufficient and inexact, and he therefore determined to study the blood sugar after a rectal injection of glucose solution, endeavoring to decide not only whether it was absorbed, but how quickly and completely it took place. He used what is known as the method of Maclean. This method requires a very small amount of blood (0.2 Cc.) and therefore is particularly advantageous when the sugar content of human blood is being studied. He dissolved 2 ounces of solid

glucose in 6 ounces of normal saline and injected this slowly into the rectum, following the method ordinarily employed in attempted rectal feeding and allowing ten minutes for the period of injection. He used this small bulk of fluid with the hope that it would be readily retained, and this proved to be the case.

Tallerman first took a sample of the blood before injection, and at regular intervals afterward, making a sugar estimation from each sample. Finding that 20 minutes after the injection was too soon to get results, he resorted to half-hour intervals, taking in all six samples at such periods, with the final sample at the end of the fourth hour. Care was taken to employ patients in whom there was no disease or disorder of the bowel. As a result of his experiments he found not only that absorption of glucose takes place, and that the maximum is usually obtained in about one hour and twenty minutes, but that the absorption by rectum is by no means as rapid as when the carbohydrate is taken by the mouth. Thus the maximum quantity which he found after rectal injection in the blood was 0.03 per cent, whereas the maximum rise in blood sugar when it was taken by the mouth at the end of 30 minutes was 0.05 or 0.06 per cent increase. In other words, absorption by the mouth is about three times as fast and almost double what it is when the glucose is given by the rectum. On the other hand the blood sugar was found to drop to its normal level when the glucose was given by the bowel in about four hours, whereas when given by the mouth this occurred in a much shorter time. Tallerman quotes Grützner and Cannon as expressing belief that a large part of the absorption of rectal injections appears to take place in the small intestine, being pushed into that part of the bowel by an antiperistalsis. This conception does not appeal to us, however, because in man the ileocecal valve prevents the passage of the contents of the cecum into the small intestine unless a very large bulk of fluid under considerable pressure is injected.

Another point which is of considerable interest in connection with this research is

the statement by von Noorden, that dextrin is of greater value than glucose, not only being cheaper, but because as a colloid it can be used in higher concentrations than glucose and is equally satisfactory, and, furthermore, its absorption will be continued over a longer period of time, so that the tissues are not flooded with sugar as freely as if glucose is used. This possibly is the explanation of the statement made by Ornstein, to which we have already referred, namely, that glucose given with starch is better absorbed than glucose given alone. The important point in this matter, however, is that Tallerman's research, combined with the observations made by others, would indicate that while predigested proteids given by rectum are of little or no value, carbohydrate injections so administered may be definitely relied upon, and this is the more important because in most cases in which nutrient enemata are believed to be necessary the patient is in greater need of nutrition through carbohydrates than nutrition produced by albuminous substances.

THE EFFECT OF HIGH TEMPERATURE ON THE ACTION OF DIGITALIS.

We believe that it is almost the universal experience of clinicians that while digitalis often produces remarkable effects in cases of valvular disease associated with ruptured compensation, it is in the majority of instances distinctly disappointing as a cardiac stimulant in the presence of acute infectious fevers, and while it is generally used with the hope that it may do good, it certainly often fails. One reason for this, doubtless, lies in the fact that the infectious process produces an acute or subacute myocarditis which so changes the susceptibility of the heart muscle to digitalis that it is unable to respond to the physiological action of this drug. This is certainly true in many cases of chronic myocarditis, and it is possible that the toxins of the acute infection may also directly antagonize the digitalis effect.

Many years ago the late Sir Lauder

Brunton, of London, pointed out that the presence of high fever prevented digitalis from slowing the heart by stimulating the pneumogastric nerves. Whether it be reflex effect or direct effect we do not know, but in some cases of acute infectious disease with high temperature we feel confident that the application of an ice-bag over the heart has been followed by the development of a digitalis effect which before the ice-bag was applied was lacking.

It is interesting to note that in a recent issue of the *Journal of Pharmacology and Experimental Therapeutics*, Hirschfelder and others report a research upon this subject, although curiously enough the conclusions which they reach are somewhat different from those which we have cited. Thus they have seemed to show that in animals in which the heart muscle was free from injury due to prolonged fever or toxemia, the factor of high temperature alone was sufficient to render it much more susceptible to the effects of digitalis than is the heart muscle when not exposed to a high temperature, and they therefore urge that great care must be exercised in using digitalis in large doses in patients with high temperature.

They quote Hart as having reported heart-block in the administration of three drachm doses of digitalis in cases of influenzal pneumonia, and state that this quantity is about half the dose in which similar effects might be expected in afebrile heart cases.

We believe that ultimately this matter must be settled by the study of patients suffering from acute infectious diseases by the aid of the electrocardiograph. Doubtless in some acute infections a partial heart-block is induced by the toxemia, and the administration of digitalis under these circumstances would prove just as harmful as would its use in cases of partial heart-block dependent upon a chronic endocarditis and myocarditis, whereas in other cases in which the toxemia possibly produces an auricular fibrillation the administration of large doses of digitalis, if it acts at all in the presence of fever, may be as

advantageous as it is when auricular fibrillation develops as a chronic malady.

All of the facts now before us indicate once more that digitalis is a powerful drug, potent for much good when employed at the right time and in the proper dose, and equally potent for harm if abused; and naturally large doses when wrongly used are more likely to produce evil effects than smaller ones.

To put it differently, the general practitioner when tempted to employ digitalis for the relief of what he thinks is a feeble heart in the course of the acute infections should study the condition of the heart muscle as accurately as possible, just as he nowadays studies it when tempted to employ digitalis in the treatment of chronic cardiac trouble, and unless he takes this precaution, while some of his patients may be markedly benefited, if by good luck they are suitable cases for this drug, in other instances he will get disastrous results, and, happily for his peace of mind, unless his attention has been called to this matter, may attribute the results to the disease when in reality he should attribute them to a sad mistake.

CARDIAC MASSAGE.

Readers of the THERAPEUTIC GAZETTE will remember that during the last few years we have referred on a number of occasions to clinical reports which have appeared, chiefly in French medical literature, as to the value of cardiac massage in accidents complicating the administration of anesthetics for surgical purposes.

It will be recalled that this term "cardiac massage" has been applied to widely divergent methods. In some instances the practitioner has believed that he has resuscitated his patient by active and vigorous massage of the præcordium without any direct contact with the heart. In this instance any effects which are produced are probably reflex rather than direct. Others have massaged the heart, during abdominal operations, by using pressure through the

diaphragm, and still others have been so bold in desperate cases as to actually incise the diaphragm, push the hand through the incision, and so use actual pressure upon the heart, which was grasped by the fingers.

There can be no doubt that efficient massage of a heart which has practically stopped pulsating can reestablish its beat. In 1893 the writer of this editorial contributed to the pages of the THERAPEUTIC GAZETTE a research, the expenses of which were paid for by the Government of Hyderabad, India, and in this research upon chloroform it was frequently found that after the heart's action had stopped and the blood-pressure had fallen to zero, if artificial respiration was established and the chest opened, massage of the distended cardiac cavities, the walls of which were fibrillating, would result in the emptying of these cavities and the reestablishment of pulsation. At that time nothing was known of so-called auricular or ventricular fibrillation, but we note with interest that Levy in "Heart," vol. vii, No. 3, quotes Prus as having demonstrated that rhythmic compression of the ventricles associated with inflation of the lungs is an efficient means of restoring ventricular contraction, his research being reported as early as 1901.

In these experiments, carried out on dogs, Prus produced ventricular fibrillation by an electric discharge and restored a regular and energetic beat in five dogs out of 35. In 29 of them some degree of spontaneous beat was restored by persistent massage, but not sufficient to sustain the circulation. Levy in two dogs induced ventricular fibrillation by adrenalin administered under light chloroform anesthesia, but failed to get the results achieved by Prus. In one case a feeble ventricular beat was obtained after eleven and a half minutes of massage, but in the other instance it failed. Levy believes that the second stage of ventricular fibrillation is due to the fact that the ventricles have become asphyxiated through the fall of blood-pressure and that the effect of artificial respiration is to remove this condition. He also found that when resuscitation was achieved the beats are

regular and apt to occur in proper sequence to the auricular beat. He employed cats in his experiments upon which these statements are based, and induced fibrillation by chloroform or the electric current. His results clearly show that ample artificial respiration is as important as cardiac massage.

The clinical deductions which should be drawn from his investigations, and those of others, are that the duration of the interval between the moment of syncope and the moment of massage, so far as the recovery of the heart's action is concerned, is closely related. He obtained successful results when applying massage not later than the first two minutes, the loss of time being more important because of the starvation of the nervous centers or their asphyxia than because of the condition of the heart muscle itself.

He joins to his report two clinical observations, one of which we have already referred to in an earlier editorial in the GAZETTE.

The first case quoted by Levy was that of a child of nine years, who was being operated on for umbilical hernia, the anesthetic being chloroform. At 12:30 the heart stopped; 25 minutes later subdiaphragmatic massage of the heart and artificial respiration were practiced. Three minutes after this a slight flutter of the heart was felt, followed in a few seconds by a vigorous beat, but sensibility never returned and the patient died in 20 hours.

Mollison's case was one in which not less than 13 minutes and probably 15 minutes elapsed between the onset of bad symptoms and the practice of massage. In this instance a child of six years was being operated on for tonsils and adenoids, the anesthetic being chloroform and ether mixture. At approximately 15 minutes after the heart stopped subdiaphragmatic massage was begun, and four minutes later approximately the heart commenced to beat. In this case artificial respiration was not performed, the patient remained unconscious for about seven days, was much improved in fourteen days, and eventually completely recovered.

A question discussed by Levy, which is of some academic interest, is how soon after cardiac arrest intercardiac clotting occurs. In animals it would seem to take place in about 36 minutes.

In conclusion, Levy expresses the belief that artificial respiration is absolutely essential when cardiac massage is practiced. He thinks that Sylvester's method is sufficient when there is no opening in the pleural cavity, provided it does not interfere with the proper performance of massage, but he recommends intubation of the larynx, the attachment of a tube and insufflation of the lungs of the patient by an artificial respiration apparatus or by blowing by another person. If no artificial respiration apparatus is at hand he even suggests that mouth-to-mouth insufflation may be practiced in an emergency. He also believes that even partial inflation of the parts is useful in such cases and emphasizes the fact that artificial respiration is not only advantageous because of its influence upon the circulatory system, but also because it serves to eliminate chloroform from the body. He believes that the value of the massage lies more in the production of an artificial circulation of oxygenated blood through the coronary arteries than upon the direct irritation of the heart muscle by handling, and points out that the successful performance of massage depends upon the efficient compression of both ventricles. Levy also insists that in order to prevent death cardiac massage should be instituted not later than five minutes from the onset of cardiac failure, although in the next sentence he states that two minutes is probably the outside limit of time which should be allowed for the chance of spontaneous recovery in man, after which the necessary operative procedures for adequate cardiac massage should be undertaken.

To sum up, therefore, Levy believes that cardiac massage should prove a scientific means of restoration from apparent death from chloroform syncope, whether this be the result of ventricular fibrillation or neglected overdoses.

THE RITUAL OF A SURGICAL OPERATION.

Under this caption Moynihan (*British Journal of Surgery*, July, 1920), than whom no surgeon is better fitted to speak from the standpoint of rich experience, deep study, and the gift of expression, formulates a method of procedure which while it contains nothing new, so clearly sets forth a rational surgical technique that it should be read and studied by every practitioner of the art.

His pronouncement begins with the statement that every operation in surgery is an experiment in bacteriology. The success of the experiment in respect of the salvation of the patient, the quality of healing in the wound, the amount of local or constitutional reaction, the discomforts during the days following operation, and the nature and severity of any possible sequels, depend not only on the skill but also upon the care exercised by the surgeon in the ritual of the operation.

The "ritualist" must not be a man unduly concerned with fixed forms and ceremonies, with carrying out the rigidly prescribed ordinances of the surgical sect to which he owes allegiance; but a man who, while observing with unfaltering loyalty those practices which experience and experiment have together imposed upon him, refuses to be merely a mimic bound by custom and routine. He must set endeavor in continual motion, and seek always and earnestly for simpler methods and a better way. In the craft of surgery the master word is simplicity.

The ritual of an operation commences before the incision is made, and may continue for a long period after the wound is healed. In the transition of a patient from ill health to sound health the operation itself is only one, though it may be the most important, of all the factors concerned in this fortunate event.

Moynihan further states that the possibility of the patient's own tissues furnishing septic organisms is so remote that it may be left out of the count entirely. It is an

excuse to condone rather than to explain the occurrence of infection.

The bacteriological experiment on the patient may be conducted with one of two intentions: the exclusion of all organisms from the wound; the destruction of all organisms reaching the wound, by a bactericide applied to the wound surfaces.

To speak strictly there is no "aseptic" surgery. In every operation some antiseptic is used on the surgeon's hands or the patient's skin. The terms are accurate enough if they are held to apply only to that part of the operation which begins with the incision of the skin. After this point the use of antiseptics in a "clean" case is rarely necessary, is often undesirable, and is almost always of greater harm than benefit.

In speaking of the results of an operation a surgeon may be a prejudiced witness as to his own efforts, and a bad judge of his own merit. When surgeons speak, for example, of "healing by first intention," one means a wound which heals within a few days, leaving a thin, straight, narrow line of palest pink. Around this line and the stitch-marks everything appears "cold." There is no redness, no swelling, no stiffness or induration, and at the line itself the most accurate apposition of skin edges is seen. There is no discharge from the wound. There has been neither local nor constitutional reaction following the operation. Another surgeon means a wound which is anything but straight; the edges are jagged, they do not meet accurately at every part, they overlap here and there; the line of healing is broad and irregular, raised and red, a sticky discharge oozes from the unapposed surfaces, and a scab may lie where this discharge has dried. The parts around are raised, tender, doughy, or stiff. The stitches seem to sink into the skin.

The cleaner and the gentler the act of operation, the less the patient suffers; the smoother and the quicker his convalescence, the more exquisite his healed wound, the happier his memory of the whole incident, to him probably one of the most important

in his life. The results of our ritual are therefore expressed not only in the mortality—where the difference may be slight—but also in the quality of the healing of the wound, and in the quality of the recovery from the operation, in respect of security, rapidity, smoothness, completeness, and finality.

In the ritual of a surgical operation the mysteries are imposed not only upon the high priest and upon the acolytes, but upon the congregation also. Every visitor to an operation theater takes a part, however remote, in the operation. He is gowned, masked, and his head covered with a cap nowadays in all clinics. But dirty boots and soiled trouser legs, conveying mud, dust, and fecal matter from the streets, are often unnoticed. If the wearer of them moves about the theater freely, or goes from one theater to another, the organisms carried in the drying filth are scattered broadcast, as the simplest experiment will prove. Large canvas overalls for the boots and the lower part of the leg, tying just below the knee, as a sort of legging, will afford ample and secure covering to this possible source of infection.

The method of the preparation of our hands and arms is important. It is still a common thing to see hands washed in a basin of still water. The moment the hands are soaped and rinsed the water is polluted by the dirt washed off the skin. If the washing is continued it is obvious that the hands are being constantly reinfected from the contaminated water. If the water is emptied away, and fresh poured in, the basin, being polluted by the water it formerly contained, defiles the fresh water. And it is really not uncommon to see a piece of soap used to lather the hands laid down and picked up again, regardless of the fact that each contact of the soap with something else is a possible method of soiling it. The best of all plans is to wash under running sterile water. Water can be boiled for a quarter of an hour, and cooled sufficiently for use in five minutes. Over the tank is placed a tap for refilling.

Almost all commercial soaps are sterile.

The outer surface of course may be polluted, but when this is washed or scraped away the exposed fresh surface of the soap is sterile. Two methods of using soap are simple and satisfactory: to use a tablet of any household soap which has been lying in a solution of acrosyl for half an hour; or to sterilize some green soft soap in a flat dish in the autoclave, and to rub off, time after time, with a sterile gauze swab, enough of the soap to form a good lather. After washing for not less than fifteen minutes, the hands should be gently rubbed with gauze wet in spirit and biniodide solution, or in a solution of acrosyl, which is the antiseptic least likely to damage the skin.

About the wearing of gloves a good deal may be said. Often they are a mere fetish. How often are gloves put on without their outer surface being touched or stroked by a bare hand? How often are they considered rather a protection for the surgeon than for the patient? Gloves may be sterilized by boiling or be placed in the autoclave with the dressings and swabs and used dry. The advantage of the dry glove is that it is more comfortable to wear during a long list of operations, and that the hand being covered by a dry sterile powder is kept free from moisture. A chance puncture of the glove does not involve the escape of a possibly contaminated fluid into the wound. Gloves should be kept on the hands till the dressing of the wound is complete, and until the coat and sleeves are removed. If gloves are properly sterilized and properly put on, the covered finger may be used to explore a knee-joint or anywhere else with impunity.

Above the gloves worn by all those directly engaged in the operation no bare arm should be seen. Either a long-sleeved gown should be worn, or sleeves which fit firmly round the wrist, there to be covered by the cuff of the glove.

An ideal skin disinfectant should be cheap and easily accessible, simple in its application, non-irritant, capable of penetrating the skin to some depth; it should be effective in destroying in a short time all of

the organisms which are found on or in the skin, and it should do nothing to prevent or delay the clean and speedy healing of the wound.

The skin disinfectant most commonly employed is iodine. It is applied in varying strengths, and in different vehicles—spirit, chloroform, acetone, benzine, etc. The tincture of iodine is the form which is most often used. Both experimentally and clinically the method is clearly of the second rate. The work of Tinker and Prince, Hunter Robb, Stanton, and others shows that even when the iodine is allowed to remain on the skin which is tested, sterilization is not always indicated by the culture tube; if the iodine is removed by a solution of potassium iodide, and the skin washed with sterile water and examined, infection is demonstrable in over 50 per cent of cases. A very large proportion of the iodine used often disappears from the skin before the operation is completed. There is nothing then to recommend iodine but the ease and rapidity with which it can be applied and its coloring of the skin; its efficacy is far less than is required, and it is a powerful irritant. Iodine, to be effective, must be applied on a dry skin, which often means a dirty skin. Picric acid in alcoholic solution of a 3 per cent or 5 per cent strength gives better results than iodine; but it does not penetrate deeply, and it is not of sufficient bactericidal value. The wounds are, again, not up to the highest standard in a large number of cases.

By far the best method of preparing the skin is carried out in three stages. Abundant washing with soap and water, preferably ether soap; gentle friction with biniodide of mercury and spirit solution 1 to 500; drying; followed by the application for two to three minutes of Harrington's solution. When the towels are fixed round the operation area a further application of Harrington's solution is made; and throughout all operations the skin is covered with towels so that no friction of the hands against it is possible.

The hands should not touch the skin at all; viscera should not be allowed to lie

upon it, and the rubbing of instruments against it must be avoided. As soon as the incision is made, cloths of several thicknesses of gauze or toweling are fixed to the skin edges and dip well into the wound. If these "tetra" cloths lie loosely on the parts around the wound, they ruffle up during the movements of the surgeon's hands. If powder is dusted on the under surface of them it is soon found to lie in the wound. The towels must therefore be held at points distant from the wound, so that they are kept stretched and fixed throughout the operation. When they are removed at the conclusion of the operation, the skin covered by them is washed over with spirit and with Harrington's solution before any stitches are inserted.

The wound is made by a firm, clean sweep of the knife. All vessels are clipped if possible, as in a hernia operation, before being cut, but certainly the moment they are cut. Most of the clips made seize not only the vessels but a mass of tissue surrounding them. When ligatures are applied, all this tissue is strangled in the ligature, and has to be digested by leucocytes in the wound. The tips of artery clips should be narrow, almost pointed.

When glands of the neck, or of the breast in a case of carcinoma, are removed, gentle traction in one direction by the surgeon, and in the opposite by his assistant, will reveal a fluffy layer of thin areolar tissue, the "white line" along which dissection can proceed very easily and quickly, and with the immediate disclosure of all the vessels which must be seized. This involves the application of many clips, but the wound should always be kept dry and unstained by blood. It should be our ideal to complete such an operation without staining the towels round the wound.

Though traction is necessary in gland and goitre operations, it must be avoided in abdominal work. The forcible and merciless retraction of the abdominal wall throughout a long operation cannot fail to cause shock and suffering afterward. The best retractor is the gentle light hand of a well-trained assistant, used mercifully when

it must be used at all. But with the adequate incisions, retraction is very little needed during the greater part of most operations.

Dissection may be carried out in two manners: by the knife, or by "gauze stripping." If by the knife, the movements should be short, sharp, close together, so that if recorded on a moving drum the picture would resemble a "feather edge." And the knife must be sharp. Big, heavy, clumsy movements with a dull knife hurt the patient, and leave the parts less fitted to heal. Throughout the operation there must be no undue exposure of parts. In a large dissection, such as that required in removal of a cancer of the breast, the dissection extends from the axilla to the umbilicus, and from the opposite pectoral muscle over the latissimus dorsi. With skin flaps turned back, the bared area is very extensive; it should never be seen as a whole. As one part of the dissection is completed, hot moist cloths are placed over the raw surface to prevent drying and chilling, and the chance of contamination. Similarly, in abdominal work, only that part of the operation field should be seen with which the operator is at the moment engaged.

Contamination may occur during an operation, and therefore the various clips, scissors, retractors, or other instruments should be resterilized as often as necessary. If, for example, a pair of scissors are used to open the intestine in a case of gastroenterostomy or colectomy, or needles to suture viscera together, they are at once discarded, and never used again till they have been boiled.

In operations for malignant disease, frequent sterilization of instruments is most necessary. Every instrument used in this dissection—knife, clips, scissors—may possibly be brought into contact with a cancer cell. When once used it is therefore laid aside, and not taken up again till it has been reboiled. Cancer cells, as Ryall and others have shown, can be grafted on to the patient's own tissues and develop a new deposit of cancer. It is obvious that the

graft may be carried on any instrument, or on the gloved hand.

As regards the material used for ligatures and sutures which must remain within the wound, certain conditions are essential. Such material should, ideally: Achieve its purpose—be sufficient to hold parts together, close vessels, etc.; disappear as soon as its work is accomplished; be free from infection; and be non-irritant.

The only material which can be made to fulfil these conditions is catgut of the small numbers. Catgut can be sterilized perfectly. The method of Claudius, which directs that the catgut should be soaked in a solution consisting of iodine 1 per cent and potassium iodide 1 per cent in water, ignores the fact that with such a proportion of iodide of potassium all the iodine is not dissolved; much of it lies inert at the bottom of the vessel. Moynihan uses a solution made in accordance with their atomic weights, iodine in a strength of 1 per cent and iodide of potassium in a strength of 1.75 per cent; the whole of the iodine is then taken up, a darker and stronger solution results, and catgut soaked in this for ten days or more is almost black in color, and so strongly permeated by iodine that it is exceedingly difficult to infect it. Silk for intestinal sutures is not necessary. An unabsorbable suture used to effect the junction in gastroenterostomy is possibly a factor causing the development of a jejunal ulcer. But thick chromic catgut also will remain for years at a suture line in such a case.

The most important person present at an operation is the patient. This is a truth not everywhere and always remembered.

The preliminary use of scopolamine, atropine, and morphine, or of omnopon, is a valuable help. One dose of about 1/100 or 1/150 grain scopolamine and 1/6 or 1/4 grain morphine is needed, according to the patient's age, size, etc. This is given about three-quarters of an hour before operation. In a private hospital the blinds should then be drawn down, the room darkened, and the patient encouraged to sleep. No talking is allowed.

The nurse remains in the room, but is warned not to speak, and of course no friends are then permitted to see the patient. When the patient is taken to the operation theater as quietly as possible, a towel covers the eyes and the operation room itself is dark. No conversation is allowed in the theater, and only the anesthetist and one nurse, or possibly two nurses, remain. Everything is kept as quiet and orderly as possible. There are very few occasions indeed when shock results from an abdominal operation properly conducted, when the patient is kept warm on the table by one device or another, and when the gentlest handling, the most careful hemostasis, and adequate protection of parts have been exercised.

Every detail in every operation is of importance, and should be conceived, practiced, and tested with unwearying patience by the operator himself, and by him in conjunction with all his assistants.

In all the movements of the surgeon there should be neither haste nor waste. It matters less how quickly an operation is done than how accurately it is done. Speed should result from the method and the practiced facility of the operator, and should not be his first and formal intention. It should be an accomplishment, not an aim. And every moment should tell, every action should achieve something. A manipulation, if it requires to be carried out, should not be half-done and hesitatingly done. It should be deliberate, firm, intentional, and final. Infinite gentleness, scrupulous care, light handling, and purposeful, effective, quiet movements which are no more than a caress, are all necessary if an operation is to be the work of an artist, and not merely of a hewer of flesh.

EMPHYEMA.

In spite of the enormous experience in the treatment of empyema incident to the many cases of pleural involvement resulting from grippal and mixed infection of the lung, and from war injuries, and in spite

of the many studies on the part of careful internists and skilled surgeons made upon these cases both clinical and post mortem, there is as yet no complete accord upon the part of the profession as to appropriate treatment, such, for instance, as obtains in regard to peritonitis.

It is universally recognized, and has been for a long time, that empyema is practically always a secondary infection similar in this respect to peritonitis. As pointed out by Wilensky (*American Journal of the Medical Sciences*, September, 1920) the primary conditions can be roughly grouped into (1) the meta- or postpneumonic empyemata; (2) those occurring by continuity from a neighboring perforating abscess, and among these abscesses of the lung take first place; and (3) the metastatic forms following a focus of suppuration at a distant point, or taking the form of fixation abscesses in the course of established and continuing bacteremias.

The empyemata which one meets most commonly are those following pneumonia. In children a form occurs in which both pleura and lung simultaneously become infected and involved.

Meta- and postpneumonic forms of empyema form about 69 per cent of the total number of cases encountered.

About 2 per cent of the empyema cases under ordinary circumstances complicate abscesses in the immediate neighborhood of the pleura. This group includes only those which are formed by direct extension or rupture of the suppurative process. Very few of these, indeed, are derived from the subdiaphragmatic space; the largest number are derived from the rupture of pulmonary abscesses.

Concerning exploratory aspiration, Wilensky believes this of high diagnostic value. He alludes to the sudden deaths which occasionally occur and for which no adequate explanation has been given. The needle should be inserted in the very center of the area thought to contain fluid. At times it happens that pus is withdrawn by the needle when no empyema exists. This is probably because the needle has entered

a large bronchus and withdrawn some of the secretion.

The Roentgen ray gives more valuable and accurate findings and is greatly to be preferred to the needle in all cases of localized empyemata whether the cavity be relatively small and obscurely placed or whether it be limited to one of the aspects of the thoracic wall. Frequently the ray will detect other unsuspected lesions, for instance associated pneumonic foci, in the same or opposite lung.

All empyemas have gone through a stage in which the exudate was a relatively clear fluid, which, as time goes on, shows a progressive turbidity and passes finally into the stage in which the exudate is frankly purulent.

As a general rule the fluid is heavily charged with bacteria, and the abundance of the latter varies inversely with the length of time since the onset of the effusion; the longer the fluid remains in the chest the greater the tendency there is for the bacteria either to disappear or to lose in virulence.

Experience has shown that the proper time for operation is when the exudate is distinctly purulent and when the initial toxemia has abated or has been overcome, or when perhaps the original pneumonia has disappeared.

Preliminary aspiration has been shown to be highly helpful and should be repeated as often as general or local signs call for it. A recrudescence of fever is a very good guide for the repetition of the procedure.

Operation should not be done until the fluid is very purulent and the toxemia has completely disappeared. At times repeated aspirations are themselves curative. This is particularly the case in infants and young children. Wilensky favors intercostal incision rather than rib resection, holding that adequate drainage can always be secured. As to rib resection it is not infrequently followed by a more or less diffuse osteomyelitis. When the cartilage becomes involved it never heals until every bit of the cartilage is removed down to the

healthy portion of the bone to which the cartilage is attached.

An important advantage of intercostal incision is that the operation can be done in bed. The drainage opening in the chest wall should not be any larger in caliber than the diameter of the main bronchus entering the lung. The simplest form of drainage apparatus—an ordinary rubber tube—is the best. None of the various forms of drainage apparatus offer any advantage. The addition of a suction apparatus in the after-treatment, for the purpose of aiding the constant evacuation of the chest, is a valuable adjunct to the treatment.

Wilensky speaks with modified enthusiasm of the Carrel-Dakin treatment. His method is as follows: A large drainage tube is coupled with the suction apparatus. The tube leading from the chest to the collecting bottle is made to connect by a T-tube with a reservoir containing the Dakin solution. The total capacity of the empyema cavity is measured with water and noted. The amount of Dakin's solution which is instilled at two-hourly intervals is equal to a few cubic centimeters less than this measured capacity. At the appropriate time the suction is blocked off with a clamp and the Dakin solution is allowed to run in to the amount indicated. Inasmuch as the effect of the free chlorine liberated from the solution is only operative for a very few minutes, there is no necessity for allowing the solution to remain in the chest for any length of time, and at the end of fifteen minutes the suction is reestablished and the entire contents are evacuated from the thorax. The suction is allowed to continue until the next instillation. If desirable the procedure can be repeated at hourly, instead of two-hourly, intervals.

The use of any method of irrigation is a new departure from the custom maintained up to the time of publication of the studies of Carrel and Dakin. One has always been taught that irrigation of any kind is dangerous when employed within the chest

and from time to time serious consequences have been reported. The knowledge has, perhaps, been a deterrent to the use of Dakin's solution in some quarters and has encouraged the use of small quantities following the use of other intrathoracic procedures, especially puncture and aspiration of the chest.

There is a great difficulty in making an accurate determination of the sterility of the cavity. The smear method is not reliable, not only because of the possibility of error while looking through the smear, but because it is common knowledge that many colonies of bacteria will grow on media when no organisms are visible in the smear. Cultures are always necessary. The sterility of the outer wound is easily demonstrated; within the cavity it is not possible to reach all parts for specimens; and while seemingly all that are obtained are sterile, other foci may be present which harbor many organisms. It is true that an absolute sterility is not necessary for the secondary closure of the wound.

As soon as the sterility of the cavity is established with a reasonable degree of certainty the practice is to discontinue all forms of irrigation or other treatment. The immediate suture of the outer wound is perhaps not advisable, owing to the frequency with which the wound reopens to permit the discharge of retained pus. It is much better practice, instead, to simply cover the wound with a dry dressing and to permit it to heal by granulation. The outer wound closes rapidly; a larger or smaller cavity—a pneumothorax—remains which, when truly sterile, does no harm; after a time the pneumothorax becomes absorbed and the cavity becomes obliterated. The pneumothorax shows no clinical evidences either subjectively or objectively. Permanent healing of the cavity must necessarily occur by complete obliteration. This probably occurs as a creeping adhesion of the adjoining parietal and visceral edge of the lining granulation membrane.

Under the newer methods of treatment

there has been a pronounced improvement in the results obtained with operations for empyema. Less frequently than heretofore the sinus in the chest fails to close within a reasonable length of time. Difficulties arise with the interpretation of the latter term, for a length of time which is "unreasonable" to one man is regarded with more or less indifference by another. Lilienthal waits only a very short time after doing the primary intercostal incision—minor thoracotomy—before he proceeds to do his larger operation of major thoracotomy; he believes the secondary procedure necessary in a great many of the cases. Recently Aschner, who is associated with Lilienthal, expressed the opinion that the secondary major thoracotomy is not necessary as often as was first believed.

There are a number of factors which interfere with the closure of the thoracic sinus after operations for empyema. Practically all of these functionate by constantly reinfecting the cavity which is to cicatrize, and many of them are those which interfere with the proper sterilization of the wound with Dakin's solution. Over some of these we have almost perfect control, as, for example, a badly carried out drainage or an osteomyelitis of the resected rib. Over others we have only partial control; such would be those empyemata which are not simple cavities but in which the main cavity is complicated by subsidiary loculi; the drainage of the latter is at best imperfect.

The greatest obstacle to healing is the presence of a bronchopulmonary fistula; over this impediment we have no control at all. The fistula may be so small as to readily escape demonstration.

Recurrences of empyema are fairly common. The essential cause for this accident is again an incomplete sterilization, or a reinfection, of the cavity; and the causes for the latter include: (1) Incomplete obliteration of the original cavity; (2) a bronchial fistula; (3) rib sequestra; (4) islands of dormant bacteria in the walls of the empyema cavity; and (5) the retention of foreign bodies.

FACTORS ENTERING INTO DELAY IN THE SURGICAL TREATMENT OF CANCER.

It will be remembered that eight years ago the Pennsylvania Medical Society appointed a committee for the purpose of studying the cancer problem, with a view to the lessening of its toll of mortality, this action being indicated by the progressive and rapid increase in the number of deaths from cancer reported. One, and perhaps the most important, finding of this committee was to the effect that, by and large, a patient afflicted with superficial cancer delayed consulting his physician twelve to fourteen months, and that the physician delayed practicing or advising surgical treatment for another twelve months. The delay was a little greater when the cancer involved the internal organs. This summarizes Wainwright's important contribution.

Gibson of New York pointed out that between 80 and 90 per cent of cancer cases are beyond surgical help at least in the form of radical cure when they apply to hospitals, and that one-half the cases have not been properly diagnosed by their doctors. A later study in the same clinic reported 50 per cent of the cases beyond surgical treatment at the time they applied for treatment, and the average lapse of time between the period when the patient was first seen by a doctor and came to the hospital was between eight and nine months.

Simmons in 1918, taking up the study of cancer of the breast, including in his series 282 cases, showed a somewhat more prompt action upon the part of the physician in referring his surgical cases. Simmons and Daland's present report (*Boston Medical and Surgical Journal*, Sept. 2, 1920) shows a still further step in the right direction. As might be expected the average age of these patients was something over fifty years. Neoplasms of the breast and cervix come something earlier than those of the buccal mucosa; prostate and skin something later. The youngest patient was fourteen, the old-

est eighty-three. There was no pronounced numerical disproportion between the males and females. The average duration of the total number of cases was twelve and a half months, subject to wide variations. From the time of the onset of symptoms and the first consultation with the physician, five and a third months elapsed. This is in favorable contrast to the fourteen months reported by the Pennsylvania Commission eight years ago. The chief reason leading to consultation with the physician was the rapidity of the growth. The quick mucous membrane lesions led the patient to the physician in about two months, cancer of the prostate in about ten months, of the breast in something over eleven months; slow-growing skin cancers something under twelve months.

The first symptom was tumor or ulcer in 36 per cent of the cases, pain in 25 per cent, what may be termed symptoms peculiar to the organ in 18 per cent, and miscellaneous in 21 per cent.

No rule can be given to the laity or to the physician as to the first symptom of cancer, although it will not be difficult to educate the public to observe the first symptom in the organs commonly affected. This will materially lessen the number of cases in the hospitals as regards operative cure when first seen.

The first symptom of cancer is the inveterate resistance of its characteristic lesion to treatment.

The average delay on the part of the physician before advising operation was three months. The greater number of physicians suspected or recognized the condition promptly and sent the patient to the hospital for operation. A few did not. In cancer of the breast there was practically no delay. In cancer of the buccal mucosa the average delay was two months, which is too long.

It is evident there is not a universal recognition of the fact that a painless and

persistent ulcer of the tongue is usually cancer; that a flow coming on several years after the menopause is usually due to cancer; and the only way to make an early diagnosis of cancer of the intestines is with the x-ray.

The average delay on the part of the patient after operation was advised was three weeks; this is practically no delay.

Of all cases admitted to the hospital less than one-half were considered suitable for an attempt at cure by a radical operation, and in these cases there was an operative mortality of 15 per cent, confined chiefly to procedures on the gastrointestinal and the genito-urinary tracts. In 28 per cent of the cases no operation was performed or exploration only, while in 27 per cent a palliative operation, such as gastroenterostomy, cauterization of the cervix, or tracheotomy, was done.

The operative mortality following palliative operations was about the same as that following the radical ones. Eleven per cent of the cases gave a history of cancer occurring in the immediate family. This suggests that heredity as a predisposing factor is of little moment.

These figures indicate a profession better trained in diagnosis and more trusting in the efficacy of surgical skill. It is recognized that no individual should die of an external cancer. This because it is at first local and can be locally and completely removed, usually by a trifling and non-disfiguring operation. The deaths are due to this failure to secure local treatment at the time the disease is still local, and lessened mortality will be incident to early recognition and prompt application of therapeutic means. That both the profession and laymen are traveling in this direction is conclusively proven by Simmons and Daland's most helpful study, and that we have still much to attain by a further development of early recognition and prompt treatment is obvious.

Progress in Therapeutics

Medical Therapeutics

Mild Chronic Nephritis in Children.

HILL, in the *Journal of the American Medical Association* of August 28, 1920, quotes a French writer, Hutinel, who wrote ten years ago as follows: "Let me insist that in dealing with these nephritic children it is especially important to pay attention to careful nursing and hygiene. It is by these measures that the malady is cured, or, in the more serious forms, that life is prolonged. Use drugs as little as possible. Especially is it important not to irritate the kidney, and to forbid the patient eating any substances whose end-products he cannot eliminate. It is necessary, moreover, to do away with any coexisting infection, however insignificant it may appear, and to watch carefully the mouth, digestive tract, respiratory apparatus, and skin. In a word, one must remember that the kidney is delicate, and spare it as far as possible."

These words sum up most succinctly in one paragraph the general principles of treatment of mild chronic nephritis in childhood.

Hill believes that general hygiene is of far more importance than the diet. The lives of these children should be most carefully supervised. In this modern day all of us are continually seeing children who are overtired; overtired from too much school, too much music lesson, too much excitement, too much everything. The strenuous life must be strictly forbidden to these nephritic children. They must be treated along the same lines that have been insisted on for other underweight children—plenty of rest, both physical and mental, and plenty of suitable food. The question of sea or fresh water bathing often comes up, and Hill has had a good many mothers with nephritic children ask whether this may be allowed. He does not see any

reason for forbidding a nephritic child to bathe in warm water, that is 70° F. or over, but should certainly forbid it if the temperature of the water was below this. Chilling of the body surface is not good for a nephritic, and it is not unusual to have hematuria or albuminuria increase if this occurs.

The tonsils and teeth should receive very careful attention. Certainly if the tonsils have been the cause of the nephritis, as they undoubtedly are in a great many cases of this mild type, they should be removed, and even if they have not been apparently the original cause of the trouble, they should be removed if there is the slightest suspicion that they are at all diseased. Although dental infection is probably not at all a common cause of nephritis in children, the teeth of a nephritic child should be attended to, and any existing focus of infection eradicated. It is of the utmost importance to guard the child against all sorts of acute infections, such as colds, bronchitis, or measles, as often these conditions, while not serious in themselves, may cause a flaring up of the nephritic process. The kidneys of these children are hypersusceptible, and they should, therefore, not be called on to excrete toxins of any sort. If an acute exacerbation occurs, the child is of course put to bed, and is treated the same as an acute case would be.

While it certainly would not be wise to allow an unrestricted diet to these children, it is a worse mistake to restrict it too closely. There is no reason for omitting meat entirely from the diet, nor is there any good evidence that red meat is any less desirable than white. It is not at all certain what the minimum protein requirement of any child is, but it is undoubtedly a considerable amount, and in a long-

drawn-out condition, such as chronic nephritis, there is no necessity of depriving the child of meat. Meat once a day will certainly do no harm. Hill does not believe in meat soups, as their food value is practically *nil*, and it is possible that the kidney might be injured by the considerable amount of extractive material they contain. There does not seem to be, however, any actual proof that meat soups do harm, though all writers on nephritis are agreed that they should not be given. Epstein's high protein diet does not come into consideration here, as this is a nephritic with little or, at most, moderate albuminuria; and large amounts of albumin are not being lost from the body. If a child likes his food very salty, this taste should be discouraged; otherwise there is no especial necessity for salt restriction. For the severe cases of chronic nephritis with edema a low salt intake is, of course, desirable.

Water is one of the best therapeutic agents for a great many diseases, and a nephritic child without edema should be encouraged to drink water in order to keep his urine at a low specific gravity, and to dilute the products that are excreted through it.

The diet of these children may be thus summed up: meat, fish, or eggs once a day; no meat soups; a moderate salt intake, and plenty of water. Otherwise the diet can be the same as for any other child.

The prognosis of any diseased condition is what, after all, interests the patient most. There are three prognostic possibilities to be considered in mild chronic nephritis. First, the kidney may recover entirely, after a period of several years' albuminuria; secondly, a severe and fatal chronic nephritis with large amounts of albumin in the urine, and edema, may supervene; and thirdly, contracted kidney may develop, giving rise to the clinical picture known as chronic interstitial nephritis. The first two of these possibilities may occur, but he has followed no case long enough to be sure of the third. The reparative power of a growing child is re-

markable, and it is quite possible to recover entirely from this mild type of nephritis. Hill has seen one patient apparently recover after four years of albuminuria, and another after two. On the other hand, not a few cases get worse, particularly after each acute exacerbation, and on the whole the chance for recovery is probably not as good as for the development of a severe nephritis in the course of time. The functional tests are of considerable value in prognosis. Repeatedly low phenolsulphonephthalein tests usually indicate a bad prognosis, and yet he recalls one girl who never has had a phenolsulphonephthalein test above 40 since the development of her nephritis, and who is still alive and apparently getting on very well after five years.

Normal phenolsulphonephthalein tests are not of much value in prognosis, as it is possible for severe kidney damage to exist with phenolsulphonephthalein outputs of from 60 to 70 per cent. If a child has a normal two-hour test, on the other hand, his kidneys are probably only slightly damaged, as this is a very delicate and reliable test. An abnormal two-hour test, with a considerable degree of fixation, means a damaged kidney, but not necessarily a severely damaged one. By the combined information which these two tests give us it is possible to get a fair representation of the kidney's functional power. In acute nephritis it is possible to estimate the severity of the kidney damage by the general condition of the child—in the mild type of chronic nephritis, when the child looks fairly well, and when the urinary examination does not tell much regarding the degree of kidney damage, the functional tests may help a good deal. As Sir James McKenzie once said, prognosis of chronic disease is what most of us know least about, as we often lose track of our patients after a few years, and it would be necessary to follow a large number of these cases over a period of at least ten years in order to have any really adequate idea concerning their prognosis.

Spastic Constipation.

In the *New Orleans Medical and Surgical Journal* for August, 1920, PERRET states that constipation is undoubtedly "the commonest ill that human flesh is heir to." Important as the condition is, it is not usually accorded the consideration which it deserves. It is such a frequent complaint, and as the evil effect resulting from it is not always immediately evident it is not taken seriously.

Again, as the causes that produce it are so numerous and varied and not always at once clear, many practitioners content themselves by dismissing the patient with a prescription for a purgative. The natural result is that frequently not only is the trouble not cured but often aggravated.

The object of his brief paper is to show the necessity of making a correct diagnosis, if we wish to cure the patient. Lack of care is the cause of more mistakes than lack of knowledge. If we take the trouble to obtain a good clinical history, make a thorough physical examination, and submit the gastrointestinal tract to a barium meal examination with the x -ray, we ought to be able in the majority of cases to arrive at a correct diagnosis.

Careless, slipshod therapeutics will avail us but little, if the cause of the constipation is due to a lack of gastrohepatic secretion. It is evident that drugs acting on the intestines will not do any good; again, if the trouble is due to atony of the bowels, antispasmodics will not help. Some cases are due to reflex causes from a diseased appendix, others to kinks which may call for surgical intervention. Hence the necessity for getting at the bottom of the trouble and trying to remove it.

No attempt is here made to list all the causes of constipation which may be found in any text on the practice of medicine.

The importance of the spastic type of constipation, which is well recognized, is not often enough borne in mind, with the result that these cases are often missed. With the more frequent use of the x -ray, however, more of these cases are being dis-

covered. Of course it may not be practicable for every one to have access to an x -ray laboratory, or the patient may not be able to afford to pay for such an examination. In such cases where we suspect spasmodic constipation we ought to try the therapeutic test with antispasmodic drugs, the best of which is tincture of belladonna.

Spastic constipation may be due to a marked local vagus stimulation or to an increased irritability of the neurones supplying the intestinal muscles. Reflex causes are diseases of the eye, lungs, appendix, stomach, liver, gall-bladder, pancreas, kidneys, etc. The stimulus is carried by means of the vagus nerve, hence the value of drugs of the belladonna group which antagonize its action.

Carminative Action of Volatile Oils.

GUNN, in the *Journal of Pharmacology and Experimental Therapeutics* for August, 1920, states: (1) The carminative action of volatile oils can best be explained by their relaxing and inhibiting the movements of plain muscle. (2) Their other effects on the gastrointestinal tract may be explained by their local irritant action, by reflexes arising therefrom, or possibly by acceleration of absorption.

A Plea for the Rectal Examination in Labor.

MONASH, in the *Illinois Medical Journal* for August, 1920, states that in actual practice 90 per cent of all normal labors can be conducted without a vaginal examination. The routine pelvic measurements should have, of course, been taken during pregnancy, and the patient goes into labor with the diagnosis of presentation and position determined by external or abdominal palpation. Therefore no vaginal examination is necessary. The fetal heart action is watched by frequent auscultation. The rate of progress of labor can often be measured by external signs, and to intelligently follow the course of the labor, pelvic

exploration by the finger in the rectum gives all the information desired. The degree of effacement, the size of the dilating cervix, the degree of engagement of the presenting part, the presence or absence of the pouting bag of waters, the presence of the forelying or prolapsed cord, placenta previa, abortion in progress—all these and more can be determined.

The technique of preparation for rectal examination is infinitely less complicated than for vaginal examination. The sterile rubber glove is slipped on and anointed with a sterile lubricant and the exploration made. The presenting part is passed down by the external hand above the symphysis. After some experience one becomes very proficient, and the educated finger is soon able to determine the pelvic obstetric findings quite as definitely as by the vaginal route. With the softening and relaxation of the sphincter ani and levator ani during labor the finger meets little resistance and causes no pain. Exceptionally where the examination per rectum is unsatisfactory or indefinite or inconclusive, as in breech or face cases, a vaginal examination after proper aseptic preparation should be made. In the experience of Monash it is a rare thing to make a vaginal examination in a normal case, and often in spontaneous labors the course is satisfactorily watched throughout by abdominal examination alone or combined with rectal exploration.

In operative cases, such as one requiring forceps, the progress of the labor is followed by the rectal finger, and only just before the application of the forceps and after thorough aseptic preparation is the vaginal examination made. Furthermore, by means of the routine rectal examination the vagina is not invaded and a pubiotomy or a late Cæsarian section may be done without fear of a preliminary infection by a previous vaginal examination.

At the Chicago Lying-in Hospital internes watching labor cases are directed as follows:

Insert the lubricated gloved finger gently as far as it will go. Examine as follows:

1. Head or breech? Or what?
2. Position of presenting part?
3. Is presenting part engaged?
4. Where is the cervix? How much effacement and dilatation?
5. Is the bag of waters ruptured?
6. Is the cord prolapsed or are there other anomalies present?
7. If head is not engaged why is it not? (Contracted pelvis? tumor? scars? placenta previa?)

Caution.—Do not handle rectum roughly, and be careful in palpating tumors as you may push your finger through into the vagina. Record findings on labor record immediately after examination, and report to physician in charge in private cases.

At the Chicago Lying-in Hospital Dispensary, where thousands of patients have been confined in tenement homes, the attending obstetricians, internes and students all use the rectal examination in labor, learning and applying this method with ever-increasing facility and expertness, and with a definite and demonstrable reduction in incidence of subsequent temperatures as compared with a previous period of years when the vaginal examination was permitted.

Practice with this method makes for efficiency. The educated finger soon becomes skilled and gives most accurate information. This route is so easily tried out and has so many points to its credit that those who have become proficient in this procedure predict its general adoption.

The advantages of this method are:

Rectal examination combined with abdominal palpation in pregnancy and labor is an efficient substitute for vaginal examination, and is compatible with the intelligent management of childbirth in 90 per cent of all normal cases.

Rectal examination before, during, and after labor, as well as in miscarriage and premature labor, marks a distinct advance in the prevention of puerperal infection.

Rectal examination may be repeated at frequent intervals without the slightest harm to the patient, while the repeated

vaginal examination in the light of modern aseptic management is to be condemned.

Rectal examination is more easily done and with the least preparation of the patient when the examiner wishes to determine whether the patient is in labor, and if it is safe for him to leave or necessary to remain at the bedside. It is a time-saver. It is practically painless. In border-line cases in which Cæsarian section is considered it presents the advantage of an uninvaded vagina.

The obstetrician who examines by the rectal route enjoys a justifiable peace of mind and freedom from censure if his patient subsequently develops fever.

Acute Mastoiditis.

In the *Chicago Medical Recorder* for August, 1920, TRVNNEN states that there is a unanimity of opinion among observers that the majority of acute middle-ear suppurations involve to a greater or less extent the mastoid cells. Politzer, from numerous post-mortem examinations, concludes that in every acute middle-ear suppuration pus is present in the pneumatic cells of the mastoid. To what extent this mastoid involvement shall progress depends upon the thoroughness, promptness and correctness of the treatment of the primary disease, nature's provision for drainage of the cells involved, effectiveness of measures adopted to promote drainage, the character of the invading microorganism, and the quality of the tissue resistance.

A reasonable doubt often arises as to the wisdom of instituting an immediate operative procedure on the mastoid. The paramount desire to save the patient unnecessary operation justifies a resort to abortive measures in all such cases in which operation on the mastoid is not clearly indicated. It is important to recognize that a mastoiditis, secondary to a middle-ear suppuration caused by influenza, diphtheria, scarlet fever, tuberculosis, or syphilis, rarely is amenable to abortive measures, but usually requires the mastoid operation. The abortive measures comprise: free drainage,

local depletion, application of cold, rest, regulation of diet, and attention to the bowels.

Free drainage is best secured by an early free incision of the drum membrane. Puncturing with a spear-shaped instrument is practically worthless; the small opening thus produced closes quickly and fails to provide the avenue necessary for free drainage. A free incision over the most bulging portion or in the posterior half of the drumhead, extending along the posterior border of the drum from a point opposite the stapes to the lowest point of the membrane, should be done. To this is often added a prolongation of the incision above and outward along the supero-posterior wall of the canal, a distance of one-quarter of an inch. Irrigation of the external canal with one-to-five-thousand bichloride solution should precede the operation. A general anesthetic, nitrous oxide or ether, is necessary in children or very nervous individuals. Instilling a few drops of a mixture containing cocaine hydrochloride 5 to 10 grains, alcohol 1 drachm, anilin oil 1 drachm, is a favorite local anesthetic. In his experience an early and free incision of the drum has proven most effective in checking the acute middle-ear infection and preventing mastoid involvement. In his opinion it must be done early to produce a decisive result, particularly in infants and children. Bulging of the drum membrane is relatively a late symptom of middle-ear suppuration, and one should not wait until it has appeared before deciding to incise the membrane. In all suspicious cases our most effective endeavors at prevention will be attained by a prompt, free, and early incision. It is often necessary to repeat the incision should symptoms of retention appear.

After incision, irrigation with various warm antiseptic solutions (boric acid, saturated solution; normal salt solution; bichloride solution, one to five thousand) are used with the twofold purpose of promoting drainage and destroying the microorganisms. The frequency of the irrigation is governed by the amount of the dis-

charge; every two or three hours is usually sufficient; the amount used should not be less than a pint. Either a rubber bulb or preferably a fountain syringe previously sterilized may be used, a suitable tip for the latter being provided. Only very slight pressure is permitted in conducting the irrigations, to insure which proper precautions are taken both in regulating the height of the douche bag or the pressure upon the bulb. To avoid injuring the drum membrane, irrigating the inflamed tissues, or producing a "dizzy" or "fainting" spell, the solution should be warm and the stream with slight pressure directed along the various walls of the external canal, and not directly inward upon the drum. After each irrigation the external canal, if possible, should be dried to its farthest depth with a cotton-tipped applicator and strip of gauze (boric or plain) inserted, not packed, to the depth of the drum membrane. Under no circumstances should the various combinations of sweet oil, glycerin or powders, etc., be used in the ear at this particular stage. In children, especially, the introduction of laudanum or cocaine "ear drops" is liable to produce toxic symptoms.

Recognizing that a suppurative otitis media, upon which a mastoid involvement usually depends, is consequent upon an extension of infective processes from the nose, throat, or nasopharynx, it is of importance that proper therapeutic measures be directed throughout the treatment to the relief of these contributory conditions. An important consideration also, in his opinion, is the necessity of providing complete physiological rest for the patient during the treatment. As a rule he should, if possible, be sent to a hospital, placed in bed, and the treatments, irrigations, medications, etc., administered by a nurse skilled in such procedures. The practice of permitting such patients to irrigate their own ears and visit offices for observation and treatment is a pernicious one and serves undoubtedly to prolong and accentuate the infective process, as well as exposing the patient to the danger of additional infections.

In the early stages local depletion is ad-

vocated enthusiastically by some, while others, notably Dench, consider it worthless. In the adult it is necessary to remove considerable blood, about four ounces. The tip and antrum are the chief sites for the application. Either the natural or the artificial leech may be used. The advocates claim that venous stasis and edema are favorably affected, and hyperemia is produced with an increased leucocytosis, thus raising the tissue resistance and favoring the destruction of pathogenic bacteria.

Bier's hyperemic treatment, seldom used, has not met with general favor, and its therapeutic value in acute mastoiditis is doubtful. The usual method of application is as follows: The patient wears an elastic bandage, 3 cm. wide, around the neck for at least ten and as a rule twenty to twenty-two hours. The pressure produces stasis and increases leucocytosis.

The application of cold may prove serviceable in the early or hyperemic stage. The methods of application are the ice-bag and Leiter coil. The relief from pain it usually produces should not be accepted unconditionally, for this apparent relief may be transitory and only engender a false sense of security. Forty-eight hours is the extreme limit for its continuous application; beyond this period its usefulness is questionable. Politzer states that if the cold eases the pain, the continuation of the inflammation may be assumed; if it proves irritating and unpleasant, the disappearance of the inflammation is probable.

The patient should be put to bed as already stated and calomel in broken doses or a saline administered. The diet should be light, preferably milk. Only exceptionally should morphine and similar remedies be employed, as the relief they produce tends to mask the symptoms.

Counter-irritants, as painting the mastoid with tincture of iodine, applying a blister, application of ointments or mercury and silver, and the Wilde incision, are measures to be condemned. The chief objection to the majority of these is that the consequent soreness they produce adds an additional handicap in estimating the degree and

progress of the local tenderness; while the therapeutic value of the remainder is open to question. Bacon strongly protests against the use of the blister for this reason, and adds that the practice is pernicious and tends to aggravate the disease. The value of the Wilde incision is dismissed by Whiting in the following emphatic language: "Its performance at the present day is a senseless proceeding, for the reason that it is not calculated to reach the sources of the disease." And again, "As a general proposition we may affirm that whenever Wilde's incision is indicated, a mastoid operation is imperative." Some authors claim, however, that subperiosteal abscess, in infants and children, may originate beneath the periosteum of the meatus with no perforation of the cortex, and that, in these types, a Wilde incision is serviceable.

Tivnen has for some time practiced the following routine measures in the management of cases of suspected acute mastoiditis in the early stages consequent upon the middle-ear suppurations: (1) The patient is placed in bed, preferably in a hospital, and absolute quiet insisted upon. (2) Calomel is administered, in quarter-grain doses, followed by a saline or enema. (3) Light diet. (4) If drainage through the external ear is not satisfactory a free incision of the drum is made and a gauze drain inserted. (5) Irrigation with hot normal salt solution, a pint every two hours; each irrigation being followed by deep thorough cleansing of the canal with cotton-tipped applicator and instillation of argyrol. (6) A thin sterile dressing is applied over the external meatus and secured by one turn of a roller bandage; this insures surgical cleanliness, and prevents discharge from contaminating the pillow and patient. Fresh dressing is applied after each irrigation. (7) To prevent a dermatitis, zinc oxide ointment is applied to the external canal and auricle. (8) Ice-bag or Leiter coil to mastoid region continuously for twenty-four to thirty-six hours. (9) Temperature and pulse taken every two hours. (10) Bacteriological examinations of aural discharge and blood examination made at

once and repeated as often as indications suggest. (11) Roentgenograms of suspected and healthy mastoid, repeated as often as thought necessary. (12) Attention to nose and throat by spray, gargle, or local applications.

The Effect upon the Blood-pressure of the Injection of Adrenalin in Dementia Præcox.

In the *Boston Medical and Surgical Journal* of August 12, 1920, LOWREY and WRIGHT refer to two papers on this topic, one by Neubürger and one by Walter and Krumbach, which were reviewed in the *Psychiatric Bulletin* for January, 1916. The cases presented showed a considerable variation in reaction to adrenalin, which usually (though apparently not constantly) gives rise to an increase in blood-pressure in normal individuals. Both papers present certain cases regarded as normal in which such rise failed to occur. Schmidt has shown, as he believes, that cases of dementia præcox, especially the hebephrenic and catatonic types, fail to react to such injections.

The observations recorded in the first two papers mentioned reveal much variation in reaction among the præcox cases, with failure of reaction in certain manic-depressive cases, so that the value of the test in differential diagnosis was regarded as extremely limited, especially in that very difficult field where an accurate aid is so much desired—*i. e.*, between manic-depressive and dementia præcox.

Other observers have claimed that the instillation of adrenalin into the conjunctival sac is not followed by the characteristic reaction in dementia præcox, but Fuller, working at the Westboro State Hospital, showed that the reaction occurred in otherwise typical præcox cases, and failed to occur in cases not præcox in type, and so concluded that the reaction was of no value in diagnosis.

Their work was done in the winter of 1918. In all seventy-eight cases were tested. The blood-pressure was first taken;

pressure in the cuff released; a subcutaneous injection of 1 Cc. of 1:1000 P. D. & Co. adrenalin solution given. The blood-pressure was then taken five, ten, fifteen, twenty, and thirty minutes after the injection. In sixty-eight of the seventy-eight cases there was a rise in the blood-pressure, in all but one case the maximum rise occurring in fifteen minutes, and in all but nine cases within ten minutes. The maximum rise varied from 5 to 50 mm. Hg. and no significance can apparently be attached to the height of the rise, as the following table will show:

CASES TESTED AND RESULTS.

Diagnosis.	Blood-pressure.	
	Rise.	Fall.
Dementia Præcox:		
Undiagnosed type	85	80
Paranoid	16	15
Catatonic	6	6
Hebephrenic	3	3
Manic depressive	6	5
Acute alcoholic hallucinosis ...	4	3
General paresis	5	3
Delirium with influenza	2	2
Hysteria	1	1
	78	68
		10

In the unclassified group of dementia præcox, eighteen showed a rise of 10 mm. or less; and only three over 20 mm., one of these reaching 50 mm. Hg. In the paranoid group eight rose to 10 mm. or less, and two over 20 mm. Hg. Four of the six catatonic cases rose from 15 to 20 mm.; all of the hebephrenic under 15. Fourteen of the 54 cases in the dementia præcox group, showing rise, rose 5 mm. or less.

The only significance to be attached to observations in the other groups lies in the fact that some cases show a drop in blood-pressure. The rises are from 5 to 25 mm., most of them under 20.

In one case of hysteria they were dealing with, a man with hysterical paralysis of the right arm, before the injection the blood-pressure in both arms was 110/90. Five minutes afterward it was 135/85 in the left, and 130/85 in the right; but ten minutes after the injection the blood-pressure in the left arm was nearly normal—115/80—while in the right (paralyzed) arm it was 125/80, a striking point meriting further investigation in similar cases.

From an analysis of the blood-pressure reactions to the injections of adrenalin in

78 psychopathic cases, it is clear that it does not have the value in differential diagnosis which has been claimed for it, at least in early cases, since cases of præcox show a rise and other cases show a fall. In 54 of 60 cases of dementia præcox there was an increase in blood-pressure, 40 of these showing rise of more than 5 mm. Hg. In 18 cases of other types taken for comparison there was a depressor reaction in four.

The cases were carefully selected so that Lowrey and Wright might be as certain as is clinically possible that they belonged to the groups stated.

Adrenalin and the Bronchioles.

The *British Medical Journal* of August 14, 1920, cites a demonstration which was given by Prof. W. E. Dixon on the action of adrenalin on the bronchioles. The quantity of air entering the middle lobe of the right lung and the blood-pressure were measured in a decerebrated cat. Two injections of adrenalin were given; the effect of each was to increase the volume of air entering the lung as the result of dilatation of the bronchioles and to cause a rise of blood-pressure. The effects were temporary. The third injection was atropine, which produced permanent and maximal bronchodilatation by paralyzing the bronchoconstrictor nerves, and increased cardiac rate, and therefore blood-pressure, by paralyzing the cardiac vagus.

Diagnosis and Treatment of Hyperthyroidism.

FUSSELL, in the *New York Medical Journal* of August 14, 1920, states that the following succinct plan may be followed in treating hyperthyroidism with the minimum of fatality:

First. An early diagnosis is imperative by the methods here detailed.

Second. Every patient should be put to rest in order to reduce the metabolism rate. Many patients will be cured by this means.

Third. Patients who cannot give the

time to a thorough trial of rest should be operated upon early, after a partial rest.

Fourth. Patients who are very toxic must always be put at rest and given other appropriate treatment before any form of surgery is attempted.

Fifth. If patients fail to improve under rest, ligation should be done, or the Roentgen ray should be used tentatively to reduce the metabolism rate, until a resection can be done.

Sixth. In very severe cases in which the patients appear to be approaching death, and the *x*-ray cannot be used, a ligation after the method of Wood may be done.

He thoroughly believes that in patients who do not promptly respond to rest, surgery by all odds is the proper procedure.

Indigo-carmin as a Functional Kidney Test.

HARPSTER, in the *Urologic and Cutaneous Review* for August, 1920, states that the great number of tests speaks, at times, for the inaccuracy of all. However, after many years of observation, and the use of a number of the different tests on the same patient, he is convinced, with Thomas and Furness and many other workers in this field of human endeavor, that, all things considered, the indigo-carmin test, with the dye properly prepared and administered intravenously, is the most reliable and simplest of all tests. He realizes that this statement will probably meet with condemnation, and perhaps ridicule, but nevertheless such is his honest opinion.

He still prepares his solutions according to the methods used in the foreign clinics where he was trained.

Five indigo-carmin tablets are dissolved in 100 Cc. of sterile water and concentrated down to 20 Cc. over a water-bath and bottled in sterile glass containers. Twenty Cc. are then injected into the buttocks, or better resterilized and injected into a vein.

The earliest time of the appearance of the dye was eight minutes. The latest time recorded of the appearance of the dye was

fifty-eight minutes. In a few cases the dye did not appear at all, or at least while the patient was under his observation, which was probably three hours.

He has come to consider a kidney as normal where the dye appears in from ten to twenty minutes.

Furness has a number of times called his attention to the simplicity of the method and the rapidity with which an accurate functional diagnosis can be made.

His usual procedure is to introduce the cystoscope into the bladder distended with sterile water, locate the ureteral orifices, inject the dye and watch for the time of its appearance. If the dye appears on the right side in twelve minutes, on the left side in twenty minutes, he accepts the findings as a slight impairment of the left kidney. If the dye appears on the right side in ten minutes, and on the left side in thirty minutes or more, he accepts the finding as a serious impairment of the left kidney.

He has repeatedly checked up these cases with phloridzin, phthalein, cryoscopy, and other tests, which have confirmed his original diagnoses. He has repeatedly "gone to bat" on the indigo-carmin findings alone, and not once failed to make a "home run."

It is not necessary to catheterize the ureters, and one hour or less will complete the examination, while by using all the tests often an entire day is consumed in making a functional kidney diagnosis. Thomas says: "There is one feature of the quantitative employment of indigo-carmin which has placed its reliability without a peer, and that is its index of elimination. He believes the index of elimination shows the stability of the kidney function—this is the all-important consideration—more accurately than the mere quantitative output for the first two hours, particularly as the time required for the drug to appear is ignored."

In other words, the time of the appearance of the dye is the vital point, and not the amount of the dye that can be recovered, after two hours' time, from each kidney.

This was the original idea of Richter, Casper, Nitze, and Israel, and has never

been improved upon. Thus, when the elimination for the third hour after the injection of the dye exceeds the elimination for the first hour, the patient is said to be in the negative phase, and operation is contraindicated.

On the other hand, when the amount for the first hour exceeds that for the third hour, the patient is in the positive phase, and should be a good operative risk.

The amount of the dye secreted each hour from each kidney can be easily determined with an indigo-carmin colorimeter or index, and, of course, the ureters in these cases must be catheterized.

No doubt some urologists have never failed to catheterize the ureters (according to their own story), but cases are occasionally found in which the ureteral orifices cannot be found even after one or two hours searching. In these cases the indigo-carmin squirting from the mouth of each ureter is the most valuable aid we have in locating the dye. Harpster spent many months in European clinics under competent instructors in trying to master the use of the cystoscope, and has, under these instructors and in his own practice, catheterized the ureters many hundreds of times, and still has cases in which the ureters cannot be catheterized. What a great aid it is to have a method that can be used where the above conditions are found! In suprapubic prostatectomy often the first stage has been performed; the exact time for the performance of the second stage or removal of the gland can be best determined, and at the earliest moment, by the employment of this test, and the best interests of the patient conserved financially and socially.

Some authors state that indigo-carmin has been displaced by phthalein for a number of reasons, chiefly because it is less accurate, and not more than 25 per cent of the amount injected is eliminated by way of the kidneys.

However, they concede that it is more rapid in appearing than methylene blue. In looking over the different authors he finds that those who condemn its use do not know how to properly use it.

Chetwood in his work on Urology says: "About 2 Cc. of a saturated solution of indigo-carmin are injected into the gluteal region, and the time is taken of its first faint appearance, and again, when the color caused by its elimination is a deep hue. Generally speaking, under normal conditions, the blue color is visible in from ten to twelve minutes after injection. In twenty-four hours about 25 per cent is eliminated."

Harpster insists that he has stated above the only proper method of preparation and administration.

By concentrating down from 100 Cc. to 20 Cc., we have a supersaturated solution, and at least 20 Cc. must be injected intravenously to secure the best and most accurate results.

The time of the appearance is the crucial or vital point.

If a quantitative elimination test is desired, the phthalein test is the best, and the checking up with the colorimeter fairly accurate. The longer the delay in discoloration, the greater the disturbance of function of the kidney, and the same is true of the intensity of the discoloration.

The total nitrogen and urea estimation is complicated by the difficulty of the test, the diet must be exact, and a 24-hour specimen of urine is required. This is impracticable and inadvisable in collecting urine from the ureteral catheters.

Normally, ureteral ejaculations begin by the meatus raising itself with an effort, as if under the influence of a wave, animated by the contraction of the muscular fiber of the ureter. Next, the orifice opens slightly, giving passage to a jet of clear liquid. It remains open an instant and then contracts. It looks like glycerin mixing with water. The emission is ordinarily repeated every twenty or thirty seconds, or longer.

Normally, after the injection of indigo-carmin, when the kidney is not impaired, the blue can be seen readily after some minutes.

Ureteral emissions containing blood may establish the diagnosis of renal hematuria, but a definite cause for the bleeding must,

if possible, be determined. Burroughs, Wellcome & Co.'s technique is to dissolve one of their tablets of indigo-carmin in 10 Cc. of distilled water, and a portion of this solution is injected in the buttocks or a vein. It may appear in the urine in ten or twelve minutes.

Kapsammer believes that the length of the interval between the injection of the indigo-carmin and the appearance of the blue color in the urine is of the greatest importance; and also the degree of the intensity of the color must be taken into consideration.

Ninety-six men, applicants for employment, where a rigid physical examination was made, including a thorough urinalysis, blood examination, etc., etc., were tested with indigo-carmin by one of Harpster's assistants. Their ages ranged from twenty-one to fifty-six years, and all were passed as physically qualified. The tests made on these apparently normal men showed the findings as unusually accurate and very satisfactory and establish the reliability of the test.

Thompson-Walker uses 20 Cc. of a 0.4-per-cent solution. He says urine becomes tinged in five minutes (he rarely finds it in less than ten or twelve minutes), reaches its highest color in thirty to forty-five minutes, and remains colored for about twelve hours. Delay in secretion and diminution of the quantity of the dye are indications of a reduced renal function.

He says the amount injected (20 Cc.) is its greatest drawback. Harpster has in only rare instances found trouble from the amount used, and never when injected into a vein.

Blood Regeneration Following Simple Anemia.

HOOPER, ROBSCHT and WHIPPLE, in the *American Journal of Physiology* for September, 1920, state that Bland's pills are inert when added to various diets which do or do not favor rapid blood regeneration. We may not assume without positive proof that inorganic iron is of value in the treatment of secondary anemia.

Splenectomy may or may not modify this blood regeneration reaction. Limited diets following anemia periods associated with splenectomy may be the cause of fluctuations in the normal expected curve of blood regeneration.

Hemoglobin (by mouth, intravenously, or intraperitoneally) exerts a distinctly favorable influence upon subsequent blood regeneration.

Treatment of Gonorrhea in Women.

In the *British Medical Journal* of August 21, 1920, BROWDY says that to prescribe a douche or order a tampon is useless.

He would divide the disease in women into two classes: the acute or the subacute and chronic. The latter, in his opinion, are due to an undiagnosed source of infection, whether it be disease of Bartholin's glands, Skene's tubules, warts, etc., or to a true reinfection. Repeated reinfections are naturally incurable. If no focus of disease is found the discharge is probably kept up by douching, and if microscopically a diplococcus is found it will most likely be inert.

Acute gonorrhea in women is readily curable if the medical attendant has the full control and coöperation of the patient. He has obtained good results from the use of acriflavine; the drug is as efficacious as in the male.

His routine is to order the patient to sit in a hot bath containing lysol for twenty minutes daily; then after placing her in the lithotomy position he swabs the external genitalia with a solution of acriflavine (1 in 1000). If the urethra is involved, it is also swabbed by means of a little cotton-wool on the end of a probe dipped in that solution. A Sims speculum is next inserted into the vagina and the cavity similarly treated. Diseased foci are searched for, and if present destroyed. The vagina is then lightly packed with gauze soaked in acriflavine, which is left in for twelve hours. The packing aids draining, separates the surfaces, and permits of a continued action of the antiseptic; it further prevents the formation of condylomata by

absorbing discharges. This treatment is carried out twice daily. Within ten to twelve days all discharge usually ceases. Pessaries are then prescribed, one to be inserted night and morning, these being composed of lactic acid bacilli, which act as a fair substitute for the normal vaginal Döderlein bacillus.

The Schick Test, Its Control, and Active Immunization Against Diphtheria.

BLAU, in the *New York Medical Journal* of August 28, 1920, states that the method of injection is the same in all tests—in the capillary Schick test, in the capillary control test, and in the stock solution Schick test. The procedure should be uniform in all tests, and conducted as follows: Sterilize the skin with cotton soaked with alcohol and then insert the needle into the skin.

An efficient guide for the introduction of the needle into the proper layer of the skin is to be able to see the oval opening of the needle through the superficial layers of skin cells.

A definite, blanched, circumscribed, wheal-like elevation, the size of a dime, with the markings of the openings of the hair follicles distinct, shows that the injection is properly made. An ordinary one-Cc. hypodermic syringe, with a fine half-inch steel needle, can be used for the injections. The site of the injection need not be covered.

The reactions should be observed at the end of twenty-four and forty-eight hours, basing the final judgment on the last reading. In case of doubt, a reading should also be made at the end of four days.

1. The positive (+) reaction becomes apparent at the end of from one to four days, generally at the end of two days, at a time when the pseudo element of the reaction has disappeared. It consists of a definitely circumscribed area of redness, from 1 to 2½ cm. in diameter, with a superficial scaling and a beginning brownish pigmentation. A strongly positive reaction will occasionally show vesiculation of the surface layers of the epithelium.

The reaction gradually disappears in from one to four weeks, going through various stages of scaling and pigmentation. After about two weeks a distinct brownish area is seen at the site of the injection.

2. The negative (—) reaction. In most cases nothing is seen at the site of the injection. In a small proportion of cases a pseudoreaction is manifest.

3. The pseudoreaction shows an indefinite area of redness of varying size, surrounded by a secondary areola, which shades into the surrounding skin. The pseudoreaction appears earlier than the positive reaction, in from six to eighteen hours, reaches its height in from twenty-four to thirty-six hours, and has disappeared by the end of from two to four days, at a time when the positive reaction becomes apparent, and may leave a poorly defined area of pigmentation, but generally no scaling.

4. The combined reaction is a reaction showing a positive and a pseudoreaction in one. The positive element of the reaction becomes apparent at the end of from two to four days, at a time when the pseudo element of the reaction has disappeared. The appearance of the positive element of the reaction is that described under 1. The appearance of the pseudo element of the reaction is that described under 3, and resembles the reaction at the site of the control test, if there is a reaction at the control, with which it should be compared.

5. The doubtful (+ —) reaction. At times doubt arises as to what the reaction really is. The reaction may not be typically positive, or typically negative, or typically a pseudoreaction. In such cases the leaning should be toward a positive reading.

6. In the control reaction, as a rule, nothing is manifest at the site of the control test. Occasionally the control test shows a pseudoreaction.

(1) A positive reaction. If the person tested is not immune to diphtheria, the toxin in the Schick test will exert its irritant action, and the reaction is positive. A positive reaction shows that the individual has no antitoxin in his blood, showing that

he is not immune to diphtheria, and that he needs active immunization against diphtheria to render him immune against the disease.

(2) A negative reaction shows that the individual is immune against diphtheria, and therefore needs no active immunization. It also indicates, in children over eighteen months of age, the development of a natural immunity against diphtheria, which apparently is permanent.

(3) A pseudoreaction has the same significance as a negative reaction.

(4) A combined reaction has the same significance as a positive reaction.

(5) A doubtful reaction should be considered as a positive reaction, and therefore requires immunization.

The Schick test is positive between the ages of one and four years in about thirty-two per cent of normal children. It is positive in a slightly larger proportion of measles cases, in twice as many cases of scarlet fever, and in nearly three times as many cases of poliomyelitis. Susceptibility to one of the less contagious diseases, like poliomyelitis, indicates that the child is more likely to be susceptible to other contagious diseases. After the sixth year the proportion of positive reactions rapidly decreases, being positive in from four to ten per cent only. In adults eighty-five to ninety-five per cent of the tests are negative.

Sexual Psychoneuroses.

BEARDSLEY, in the *Pennsylvania Medical Journal* for August, 1920, reaches these conclusions:

1. Functional nervous conditions deserve as careful investigation and treatment as do organic illnesses and are far more easily cured.

2. The most common etiological factors in the functional nervous conditions encountered in youths and adolescents have a sexual basis.

3. Masturbation (in the wide interpretation of the term) is practically universally indulged in at certain stages of develop-

ment by boys and youths, and is a frequent habit among adolescents of both sexes.

4. The psychic effect of masturbation is to increase the liability of anxiety states, and in practical medicine the knowledge of the cause of the anxiety can be used to bring about a cure.

5. Proper explanation of the truths of sexual hygiene by the parents of children or by the family physician would accomplish much in preventing anxiety states, and all intelligent and sound advice from official sources, such as physical instructors, teachers, etc., should be encouraged.

6. The diagnosis of sexual anxiety states depends upon the elimination of organic disease by careful physical and laboratory examinations. The knowledge that practically every male youth and many females have been at some time masturbators should cause careful inquiry into the sex life and thoughts of our functional nervous patients during the adolescent period.

7. The recognition of the true cause of the symptoms renders the cure of the condition sure in an average patient.

Salvarsan by Rectum in the Form of Enterocolysis.

In the *New York Medical Journal* of August 28, 1920, WRIGHT reports that following the basic principles that the patient should be empty, thirsty, and hungry, his patients were made empty and hungry by starvation and purgation and thirsty by withholding liquids and giving a few doses of atropine. In a series of fifty cases the following routine was followed:

If the administration was to take place at 1.30 P.M. the patient was given a very light supper, one fluidounce of a saturated solution of magnesium sulphate and one or two compound cathartic pills at 5 or 6 P.M. of the preceding day. The next morning they were denied the regular breakfast but were given two cups of black coffee and one piece of soft toast. At 7 A.M. they received 1/150 grain of atropine, at 10 A.M. another, and went to bed, where they remained until that evening or next morning.

At 1 P.M. they were given one-quarter of a grain of morphine and 1/150 grain atropine hypodermically. During the entire day they were denied liquids, except in some instances a half-glass of milk at noon. At 1 P.M. an enema was given, consisting of magnesium sulphate one ounce, glycerin two ounces, and hot water. By this time the condition of the patient was such that the absorption of the enteroclysis by a dried-up bowel was an easy matter—this is what he wished to accomplish. At 1.30 P.M. the enteroclysis was given and continued at a rate of forty-five to fifty-five drops a minute.

The solutions used varied according to whether salvarsan or arsenobenzol, neo-salvarsan or neoarsenobenzol was given. If arsenobenzol was used it was prepared as usual and diluted with hot normal saline to 260-320 Cc. and the enteroclysis bag kept hot by hot-water bags or electrical appliances. The neoarsenobenzol was dissolved in 60 Cc. of water at room temperature and diluted to 200-260 Cc. with normal saline and required no heat. The rate of flow ran from forty-five to fifty-five drops a minute and generally required one and a half to two hours for the injection. At first

Dilution used. Rate of flow.	200 Cc.		280 Cc.		260 Cc.	
	hrs.	min.	hrs.	min.	hrs.	min.
40 gtt. per min.	1	15	1	27	1	38
42 " " "	1	11	1	22	1	33
45 " " "	1	7	1	17	1	27
47 " " "	1	4	1	14	1	23
50 " " "	1	0	1	9	1	18
52 " " "	0	58	1	7	1	15
55 " " "	0	55	1	3	1	10

the patients were not allowed to eat any supper that night, but later it was found that some could eat a light lunch and experience no after-effects; those who could not went without food. That night they were allowed a few liquids, and the following morning they resumed ordinary conditions and diet.

The untoward effects have been negligible and only once has anything unusual occurred, except now and then slight headache. If the patient cheats on the fasting she is likely to have nausea, perhaps vomiting and headache. One patient was given the enteroclysis with only a preliminary enema and morphine and atropine. That

night she experienced pain across the abdomen, diarrhea, painful defecation, and nausea. Bismuth, opium, plenty of water, rest in bed and liquid diet with several enemata benefited the patient. There were no later manifestations. Another patient complained of dizziness and a silly feeling, which were traced out as an idiosyncrasy to atropine and morphine.

The dose varies between 0.6 and 0.9 gramme. Nearly all were started with 0.6 gramme of arsenobenzol for the first one, two, or three doses, which was increased to 0.9 gramme as the treatment progressed. With neoarsenobenzol 0.9 gramme was given for four or five doses and then 1.0 gramme. Of course it is not presumed that salvarsan by this method is any more beneficial than when administered in other ways, and mercury and iodides are to be used in exactly the same way as in treating syphilis by the intravenous injections of salvarsan.

The indications for rectal administration are as follows:

1. Fat patients with small or no visible superficial veins.
2. Scrawny patients with poor veins.
3. Children.
4. Women for whom needlemarks in the arm would prove inconvenient in evening dress.
5. Patients with knotted veins from previous intravenous injections.
6. Hysterical and highly nervous types of patients.

Wright further remarks:

1. It is thought that by this method the solution is picked up by the blood-vessels and lymphatics of the rectum and sigmoid and the greater proportion of the solution conveyed directly to the liver whence it is meted out, and that much more salvarsan enters the liver and is stored there by this method than by the intravenous method.

2. It has been questioned whether atropine should be used. The method, however, has proved successful in the presence of atropine, the drug which the researches of Novi have proved to be of greatest avail in the prophylaxis of nitritoid shock.

3. Morphine tends to quiet the patient

and put him in a mental and physical state of acquiescence. This is especially helpful in the case of excitable and hysterical women, in whom an extra injection of morphine is frequently indicated.

4. The saturated solution of magnesium sulphate given by mouth has a hydragogue action, and desiccates the patient as well as cleansing out the gastrointestinal tract.

5. Any preparation of arsphenamine or neoarsphenamine lends itself readily to this method of administration. In his hands, however, the neoarsphenamine has given the best results. It is less toxic and far less troublesome to prepare and administer.

6. More concentrated solutions might be used, but the above dilution has proved entirely satisfactory.

7. Critics prejudiced in favor of the intravenous administration of these drugs have raised the objection that much of the dose might be ejected by defecation. They fail to take into consideration the fact that owing to the large doses of atropine and morphine given, with the resulting bowel atony and inhibition of peristalsis, there will be no bowel movement for many hours. During this interval ample time is afforded for the slow and complete absorption of all the drug administered. On the other hand, it is well known that a fair proportion of the dose of these drugs administered intravenously is excreted during the first few hours by the kidneys. As yet there has been no time for the laboratory study of the excretions after the administration of salvarsan by rectum. But it would seem that by this method the kidney waste should be reduced; for when a given dose of arsenobenzol is injected directly into the blood stream the concentration in the blood rises immediately to above its kidney threshold value, and is only reduced to below this value after the liver has had time to effect a balance between storage and circulation. Meanwhile much of the drug has been lost by the kidney excretion. In injections by rectum absorption is slow, and the absorbed product passes directly to the liver, so that the latter is probably able to effect the balance between the storage and circulation

before the concentration of the drug in the blood ever reaches the kidney threshold. For this reason the kidney threshold is probably never exceeded in the blood and none of the drug is lost in the urine.

Inasmuch as Wright has been able to clear up or modify the secondary stages of syphilis and the reaction of the patient's blood to the Wassermann test by the rectal administration of salvarsan in the form of enteroclysis, without the use of mercury or iodides, he believes this to be a satisfactory method for its administration to those who are in need of it and who cannot receive it intravenously.

Relative Efficiency of the Different Mercurial Preparations.

RAMSEY and GROEBNER, in the *American Journal of Diseases of Children* for September, 1920, state that the practical deductions which may be drawn from their series of experiments are as follows:

1. Mercurial ointment, 50 per cent, is to be preferred to the less concentrated forms and need not be repeated more often than twice weekly instead of daily. The quantity of mercury absorbed is much increased by friction.

2. Calomel ointment is absorbed, but less rapidly and to a less extent than the mercurial ointment, and should therefore be given in greater concentration.

3. The salicylate of mercury in oil should be given hypodermically twice weekly instead of once.

4. The mercuric chloride, by hypodermic injections, although the dose is very small, continues to be eliminated for six or seven days. The fact, however, that its use frequently is followed by the appearance of protein in the urine should exclude it from the treatment of syphilis in children.

5. Calomel by the mouth is absorbed in small amounts, and continues to be eliminated for a considerable time, so that it is probable that it would be sufficient to give it at intervals of several days, thus avoiding diarrhea.

6. Gray powder is absorbed to a small

degree and eliminated rather rapidly, so that large doses repeated daily would probably be necessary to maintain mercury in the circulation.

They intend to continue their experiments and determine, if possible, whether the clinical results will bear out the observations made in these experiments. In one case of congenital syphilis, with marked keratitis, treated by inunctions of 50-percent mercurial ointment, once weekly, the clinical progress was apparently quite as satisfactory as in cases in which daily inunctions were given.

Adjustment of Blood Volume After Injection of Isotonic Solutions of Varied Composition.

SMITH and MENDEL, in the *American Journal of Physiology* for September, 1920, state that when isotonic solutions of the acetate, nitrate, sulphocyanate, bromide, chloride, tartrate, sulphate or citrate of sodium are injected intravenously at such a rate that a volume equal to the estimated blood volume is introduced in two minutes, the rate at which the added fluid escapes from the circulation, as measured by the relative blood volume at successive subsequent intervals, is decreased to a slight extent by the sulphate, tartrate, and citrate.

When calcium chloride, hydrochloric acid or colloidal silver was dissolved in sodium chloride solution and was injected intravenously there was no alteration of the rate of return to normal blood volume.

When acacia-sodium-chloride solution was used there was a marked and long-sustained increase in the relative blood volume.

Sucrose in isotonic solution did not delay the passage of fluid from the blood-vessels.

The fluid which leaves the circulation in the restoration of blood volume after the injection could not be accounted for by the passage into the muscles or by edema fluid. The volume of urine exudate into the serous cavities and the excretion into the intestine and stomach probably are concerned in the disposal of the fluid leaving the circulation.

A Therapy for Accelerating the Elimination of Carbon Monoxide from the Blood.

HENDERSON and HAGGARD, in the *Journal of Pharmacology and Experimental Therapeutics* for August, 1920, conclude that during the development of carbon monoxide asphyxia there is vigorous hyperpnea, and thereafter, probably owing to deficient oxygenation and other causes, there is a diminished production of CO_2 . As a result of deficiency of CO_2 in the blood, asphyxiated animals when restored to pure air exhibit for half an hour or more a very marked depression of breathing. The rate of elimination of carbon monoxide is correspondingly slow. The condition of tissue asphyxia is thus continued, although the body is surrounded by fresh air.

It is suggested that this post-gassing period of continued asphyxia may be of critical importance in inducing subsequent structural degenerations and functional impairments. Its abbreviation is therefore an important object both for therapy and prophylaxis.

Oxygen inhalation during this period has only a slight effect; it is not adequately inspired.

Inhalation of CO_2 diluted with air has an immediate effect. It augments breathing and thus hastens the elimination of carbon monoxide.

Inhalation of oxygen plus CO_2 is far more effective than either gas alone; for the augmented breathing allows the oxygen to effect a rapid displacement of carbon monoxide from the blood. Functional restoration is correspondingly accelerated.

Some Salient Facts Regarding the Toxicity of Arsphenamine and Neoarsphenamine.

ROTH, in the *Archives of Dermatology and Syphilology* for September, 1920, states that the results of his experiments warrant the following conclusions:

1. Neoarsphenamine behaves differently in the animal organism from arsphenamine and should not be regarded simply as

arsphenamine in a convenient form of administration.

2. When administered intravenously and at a constant rate, acid solutions of arsphenamine are much more toxic than the corresponding alkaline solutions, the toxicity of the acid solutions increasing with the concentration.

3. A properly alkalized 2-per-cent arsphenamine solution when administered intravenously and in high dosage is slightly more toxic than a 0.5-per-cent solution.

4. The toxicity of properly alkalized arsphenamine increases greatly as the rate of its intravenous administration is increased. The rate of administration is, therefore, an important factor in determining toxicity.

5. When neoarsphenamine is found to dissolve with comparative difficulty, it is generally highly toxic and should be discarded.

6. Shaking aqueous solutions of neoarsphenamine or alkalized arsphenamine in the presence of air increases their toxicity markedly. When a 4-per-cent solution of neoarsphenamine is shaken vigorously for ten minutes its toxicity is more than quadrupled.

7. Arsphenamine preparations made in the United States are generally less toxic than those of foreign manufacture.

8. Neoarsphenamine preparations made in the United States compare favorably with, and in certain instances are decidedly less toxic than, most of the foreign products.

Provocative Procedures in the Diagnosis of Syphilis.

O'LEARY, in the *Archives of Dermatology and Syphilology* for September, 1920, in summarizing his article on this subject states:

1. The provocative procedure employed by the Section of Dermatology and Syphilology of the Mayo Clinic consists of a single intravenous injection of 3 decigrammes of arsphenamine, with a series of seven Wassermann tests made at twenty-

four-hour intervals, the first blood being drawn just before the arsphenamine injection, and, if indicated, daily observation of the patient.

2. Four factors contribute to the diagnostic worth of the procedure: (a) A true provocative effect on the Wassermann reaction. (b) The advantage of a series of Wassermann tests which strikes the average and assists in the interpretation of the spontaneous or technical variations of the ordinary Wassermann test. (c) An opportunity to observe a focal flare-up in a visible lesion, the "Jarisch-Herxheimer reaction." (d) The beginning of the therapeutic test. About one-fourth of the value of the procedure is ascribed to the provocative effect, one-half to the Wassermann series, and the remaining fourth is divided between the Herxheimer reaction and the therapeutic response elicited. The provocative procedure, including the Wassermann series, Herxheimer reaction, and early therapeutic effect, adds about 16 per cent to the sensitiveness of a conservative Wassermann test in the diagnosis of syphilis.

3. Although O'Leary believes that gradations in the strength of the true provocative effect are not essential to a positive result, and although a single positive reaction among a number of negative reactions is usually significant, it must be remembered that the provocative procedure here described is subject to the same margin of error and calls for the same interpretation of serologic methods as the Wassermann reaction itself. False positive tests and persistent negative results in the presence of syphilis may occur as in all Wassermann test techniques.

4. The use of hypersensitive antigens in a provocative procedure is to be deprecated, since they increase the risk of false positive results beyond the point justified by the general value of the procedure in diagnosis.

5. A negative provocative test does not establish the fact of cure, but a positive provocative result is of assistance in recognizing an infection which might otherwise have remained concealed.

6. The provocative procedure described is of no value alone, and should be regarded merely as a part of a general syphilologic examination. The procedure, for example, may yield negative results in the presence of positive spinal fluid findings.

7. The provocative procedure is not a substitute for clinical judgment, and should be regarded in doubtful cases merely as the beginning of a therapeutic test.

Intestinal Extraction of Adsorbed Alkaloids.

CLOWES and WALTERS, in the *Journal of the American Medical Association* of September 4, 1920, state that it has been demonstrated that alkaloids, adsorbed by fullers' earth in such a manner that they cannot be extracted by water or an aqueous solution of sodium bicarbonate having the alkalinity of intestinal contents, are released in the intestinal tract when administered orally, and that this release is not dependent on intestinal alkalinity.

The proofs of this are:

Adsorbed atropine administered to cats by mouth produced prolonged dilatation of the pupil of the eye.

Adsorbed strychnine administered by mouth caused convulsions and death in rabbits and rats.

Adsorbed emetine administered orally in large doses caused the death of cats; introduced into the peritoneal cavity it caused the death of rats. Emetine was excreted in the urine when the adsorbed alkaloid was administered orally or introduced into the peritoneal cavity. Adsorbed emetine administered orally caused diarrhea in men and animals.

Quinine was recovered in considerable amount in the urine after oral administration of the adsorbed alkaloid.

In all of the foregoing cases the dose of a given adsorbed alkaloid required to produce a specific effect was found to be larger than that of the free alkaloid, and it was demonstrated that the rate of absorption was retarded and the action of the alkaloid prolonged, thus avoiding a peak concentration.

While the alkaloids were not extracted from their adsorption compounds by water or a one-per-cent aqueous sodium bicarbonate solution, they were extracted with considerable facility by slightly alkaline and neutral soaps.

The alkaloids were extracted to a certain extent by egg-yolk, blood corpuscles, plasma, intestinal contents, and macerated intestinal mucosa.

The foregoing data agree with Sollmann's findings that the ipecac alkaloids are not released from "Alcresta ipecac" by extraction with a one-per-cent aqueous sodium bicarbonate solution *in vitro*, but they do refute the inference drawn by Sollmann that the ipecac alkaloids are not liberated in the intestine when administered orally in the form of this adsorption compound.

The War and the Heart.

In *Northwest Medicine* for September, 1920, WINSLOW states that from personal experience in the army with the unreliable diagnoses in heart cases by the general practitioner, and the almost equally unreliable opinion of the too technically trained and insufficiently experienced cardiologist, he doubts the findings of both.

It is hard to say whether the lack of ordinary substantiated knowledge about the heart is any worse than the results of a special training with all the modern physical instruments of precision, minus a long and broad clinical experience in general diseases. One may only know hearts by following them for years, and how often doctors fall down lamentably in the prognosis of heart troubles and become forever after the subjects of the patient's pet reminiscences.

The narrow perspective of the too pure cardiologist reminds one of Lincoln's story of the man with a gun who mistook a flea on his eyelash for a squirrel on a tree. If the ink polygraph (or electrocardiograph) is the only gun in the hands of the cardiologist he will not bag much game.

The cases that may be elucidated by the

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electrocardiograph include chiefly the arrhythmias, and brady- and tachycardias, and these may, in ninety cases out of a hundred, be determined satisfactorily by clinical signs and symptoms, as noted above.

While the newer instruments of precision are of great value in heart work, they are only side aids in diagnosis and cannot take the place of long and wide experience in diseases of the heart. No instrument "can replace the watchful eye, the alert ear, the tactful finger, and the logical mind which correlates the information and so reaches an exact diagnosis." And an essential addition to this is a long experience in trained observation to enable one to utilize intelligently the history, symptoms, and physical findings.

Intestinal Stasis.

Lockwood, in the *Journal of the Michigan State Medical Society* for September, 1920, claims that from an etiologic standpoint patients with chronic disordered action of the bowel may be divided into five big groups:

First, dietetic and cathartic. The contents of the canal are forced along by the peristaltic waves, and these contents furnish the stimulus to peristaltic action. The food of to-day furnishes the stool for the third or fourth day. On a small residue diet this may be five days, while on a large residue diet it may be shortened to two days. Stools may be easily marked off by administering a dose of charcoal or carmine.

Civilization has changed our habits of eating since our alimentary tract was formed. We eat a white bread from which the normal cellulose has been carefully removed. We live in cities where fresh vegetables are scarce and costly. We eat hurriedly of non-residue-containing food, because it is easier and quicker to get and eat.

In spite of this the average person feels that he should have a good bowel movement every day. He doesn't, so he takes a cathartic, the advertisement of which he

has probably seen in the paper or on a billboard. The result is a good watery movement and he feels better. The next day he has no stool because the colon has not yet had time to fill, so on the second or third day he takes another cathartic, and so on until the cathartic habit is established.

Most cathartics are irritating and produce a watering of the membrane of the bowel, just as they would produce a watering of the eye were they applied to that mucous membrane. Continuous application of these irritants produces a catarrhal condition of the bowel with mucus, accompanied by a disordered action, manifested by spasm or reversed peristalsis to protect itself from the oncoming irritant.

The second most common group of constipated people are the neurotics; here the whiplike action of the vagus and sympathetic is upset and we get various manifestations of intestinal disorder. To treat these people without making an attempt to uncover their apprehension and straighten out their conflicts in life is a mistake. The effects of emotions, anger, fear, disgust, etc., upon the motor functions of the gastrointestinal tract have been amply demonstrated both clinically and in the laboratory.

The third group includes those bowel disorders arising reflexly from disease in other portions of the body, such as pelvic inflammatory disease, chronic appendicitis, disease of the gall-bladder, gastric ulcer, etc.

The fourth group is rather common and includes the general asthenia group (asthenia universalis) manifested by ptotic abdominal organs, dropped heart, long thorax, lax abdomen, floating tenth rib, etc., together with autonomic nervous system disturbance. Here also come the congenital malformations of an extra long and redundant colon, and the acquired ptoses from a stretched-out sagging abdomen following repeated pregnancies. These people have more or less gastric disturbances and soon fall into the dietetic cathartic group.

It might be argued that many of these people have an actual partial bowel obstruction, and need short-circuiting operations,

their kinks straightened out, and bands, etc., removed, but this is not borne out clinically as they generally respond to accurate bowel management. It is true that many have more difficulty in getting their intestinal contents along toward the rectum. They have a weak spot in their anatomy which may have to be favored for years, or all their life, just as a broken leg may partially incapacitate that member for a long time. However, the longer their bowel is working right, the nearer they are to recover and the more liberties may be taken in their diet.

The fifth group is more rare and includes cases of actual organic obstruction such as tumor masses either in the bowel or pressing on it from without. Here also one would include rectocele and hernia where the bowel pushes out through the abdominal wall or vagina and produces a blind pouch, against which the normal movements cannot act. Hypertrophy of the rectal valves may also cause actual partial obstruction.

It must not be assumed that this grouping is always distinct, as most cases come under more than one group, and practically every case ends with a cathartic habit. It is rarely that patients consult us while cathartics are still efficient, or before they have bowel pain or distress.

Syphilis of the Central Nervous System.

In the *Ohio State Medical Journal* for September, 1920, CUMMER says that once the diagnosis has been made the question of treatment arises. As great as have been the advances in antisymphilitic therapy in recent years the problem of treatment of cerebrospinal manifestations is not yet satisfactorily solved. To be sure we are able to arrest the degenerative process in many more cases than we were formerly; we are able to afford symptomatic relief in many others; but our present methods still fall short of the desired optimum implied in the word cure. Even our most favorable results would be better described as arrested cases. Indeed, it is doubtful if this ideal

of absolute cure can be attained. The inaccessibility of the inflammatory areas in many portions of the brain and cord to drugs borne by the circulation, and the irreparable degeneration of nerve tracts after inflammatory processes of any extent and duration, are two important factors which add to the difficulty. We are brought face to face with the proposition we have stated before: proper treatment of cerebrospinal lues consists in its prevention. The earliest treatment of a case in the early secondary stage should be as intensive as it would be were signs of neurological syphilis present. When this ideal has not been realized the next line of defense is to recognize the invasion of the central nervous system at the first possible moment. The prompt recognition of cerebrospinal syphilis, therefore, is not something of mere academic interest; it is something of the utmost practical importance to the patient, because when the diagnosis is made early enough and efficient treatment is instituted immediately, much damage can be prevented and there is often an excellent opportunity of arresting the process. On the other hand, a delay of a few months in cases of active meningoendarteritis may permit permanent damage.

The following methods of treatment are at our disposal: mercury aided by potassium iodide; intensive intravenous use of arsphenamine; and the intraspinal use of arsphenaminized serum. Mercury is useful, but it has definite limitations. It should always be given a trial, and while the results may be excellent, they are often inadequate and disappointing. Complete reliance should not be placed upon it, since the process may advance steadily even under its vigorous use. In many instances the maximum amount of improvement is seen with the intensive intravenous use of arsphenamine. By intensive use we mean six or eight injections given at intervals of seven to ten days, alternating these, when possible, with potassium iodide and mercury inunctions or injections. Many patients obtain complete relief of the lightning pains, great improvement in general health, and

general arrest of the inflammatory process as indicated by the improvement in the laboratory findings.

A regimen composed of courses of arsphenamine alternating with courses of mercury and potassium iodide may represent all that is required in the way of active treatment. For a certain residuum of cases, however, this method of attack is far from sufficient. Many individuals are unable to tolerate it. With others who are able, excruciating pains are still experienced in spite of most intensive application; general health is greatly impaired; indeed, all the symptoms progress rapidly, while the sufferers regress from partial incapacity to complete invalidism. In these cases the patients should be given the benefit of intraspinal therapy. The chief disadvantage of intraspinal treatment is that it requires a certain amount of technical skill. The author's experience shows that it is not accompanied or followed by unfavorable results when arsphenaminized serum is given and the proper technique is employed. The efficacy of the method has aroused a considerable amount of discussion; a review of the literature shows that it is still a moot question. He has, however, followed cases for about seven years, and has reported the results from time to time. As judged by clinical observation and by repeated laboratory examinations, he feels that for many patients intraspinal therapy offers distinct hope. Whatever treatment be employed, the same rule should hold; dogged persistence in treatment on the part of both the sufferer and the physician are absolutely vital to success.

The Applications and Limitations of the Arsphenamines in Therapeutics.

In the *Archives of Dermatology and Syphilology* for September, 1920, STOKES says that the last word in any discussion of the arsphenamines in therapeutics should be an appeal for conservative interpretations. Particularly should such conservatism reign in the field of syphilis. Too short a time has elapsed since the discovery

of these drugs, and too little is as yet known about the ultimate problems of the pathology, immunology, and parasitology of syphilis to justify the announcing of new infallibilities. The necropsy pathologist of the next fifty years may well, like Warthin, upset our most plausible generalizations of to-day. Seasoned tradition and conservatism are still the wisest guides in our interpretation of clinical cure. Arsphenamine has made it apparently possible and even probable, but only to the inexperienced has cure been made absolute and inevitable. He questions, too, whether arsphenamine will prove to be the standardizer of the syphilotherapeutic field. We may prescribe minimum requirements for early cases, and if we do let us place them, if anything, far within the limits of conservatism. As for maximums, and for the adequate employment of arsphenamine in difficult cases, it will be a long day before a text-book guide and rule of thumb can pilot the inexperienced through a standardized routine to a guaranteed successful result. Stokes feels strongly that it is a major duty of all to whom circumstances have assigned the material and the facilities for such work, to provide in time, by closer observation, by follow-up, and by adequate record, the exact data on which alone can be based a final evaluation of the arsphenamines in therapeutics.

Bronchial Asthma in Childhood.

Writing in the *New York Medical Journal* of September 18, 1920, MASON states that as it takes considerable time to determine the provocative agent, it is necessary to do something in the interim to relieve the discomfort of the patient. The following are some of the drugs which may be used to give relief:

Adrenalin.—This, as a rule, clears up a case, or at least gives marked relief, within a few minutes, but, because of its potentiality and the fact that it loses its effect if repeated often, it should be given only during severe attacks or in cases in which there is only an occasional attack, say once a year.

Adrenalin can be given in doses from three to ten minims, of the one to a thousand solution, by hypodermic injection.

Benzyl Benzoate.—This is a harmless antispasmodic and in many cases gives very satisfactory results. Unfortunately, it does not relieve in all cases and has the disadvantage of having an unpleasant and lasting taste. In children who are old enough Mason gives the drug in capsules containing two minims each, four times a day. In the ten-per-cent solution the dose is half a teaspoonful four times a day for a child six years old. Increased doses do not appear to be more effective, although he knows of one case in which benzyl benzoate afforded absolutely no relief when given in one-half teaspoonful doses, but which responded to one teaspoonful doses, when, two weeks later, the patient had his next attack. Benzyl benzoate is best given continuously to patients having frequent attacks, but this is not necessary in those having only occasional asthmatic attacks.

Atropine.—When given up to the physiological limit it will sometimes be of benefit, but Mason has never found it quite satisfactory.

Iodides.—These drugs may sometimes improve the patient's condition, and can be given in the form of syrup of iodide of iron as a general tonic in all cases.

Drugs such as aspirin and the bromides are of doubtful value; nitrite of amyl or nitrite fumes are beneficial in relieving spasmodic breathing during the paroxysm.

Varicose Veins.

The *Lancet* of September 18, 1920, writing editorially on this subject, states that the September number of *Medical Science* contains an interesting review of the various methods of treating varicose veins of the lower limbs. The subject has not recently received much attention in England, and it is noteworthy that nearly all the authors and papers quoted are of continental origin. This is not owing to lack of material, for the condition is as common in this country as in any other. Probably it is due rather

to the fact that hospital accommodation is insufficient to admit of the treatment on a large scale of an ailment which is usually regarded as of minor importance. Yet the total amount of disability and suffering due to varicose veins must be enormous. Patients with this condition can be divided into two main classes: (1) Younger people with bunches of varicosities on the thigh or calf, usually along the course of the internal saphenous vein; (2) elderly people with edematous legs and one or more intractable varicose ulcers. Patients of the first class are commonly told to wear a crêpe bandage or elastic stocking, neither of which is an efficient palliative. Operations are not in favor because they are believed usually to fail, and this is no doubt true if surgical interference be not exceedingly thorough. The procedure originally recommended by Trendelenburg—namely, ligature of the saphenous vein—is not enough. All the tributaries of the vein at the saphenous opening must be ligatured and three inches of vein removed. Even then recurrence may take place owing to the communications on the back of the thigh between the internal and external saphenous vessels. To overcome this an incision should be made over the upper part of the inner head of the gastrocnemius, through which lengths of both veins can be excised together with their communications. This operation can be successfully applied to the less severe cases, but it entails keeping the patient in bed for ten days, in itself a serious drawback. Use has accordingly been made in Germany during the war of a method which, it is claimed, combines efficiency with rapidity. This depends on the injection of a one-per-cent solution of bichloride of mercury into the lumen of the vein at various points, as a result of which thrombosis takes place almost immediately at the sites of injection. The procedure is painless if care be taken that none of the solution leaks into the subcutaneous tissue, and it is stated that there is no risk from embolism. Should collateral veins become dilated afterwards they can be injected in the same way. Various

operative procedures for the severer cases have been devised, several of which depend upon the avulsion of the vein by means of appliances passed along their lumina through incision at either end, but such methods do not seem to be, surgically speaking, so sound as a thorough excision, even though this has to be rather extensive. The incisions are made, if possible, through sound skin, and if need be are extended along the whole length of the leg.

The second class of patients includes the numerous elderly women who display swollen and discolored legs, week in, week out, to despairing house surgeons in the outpatient departments of all large hospitals. With prolonged treatment the ulcers can be made to heal, but the underlying causes—varicose veins and long hours of standing in the course of domestic duties—are still present and the ulcers soon recur. Grafting from the skin at the edges of the ulcer has recently been recommended, but the artifice does not deal with the underlying cause. A more thorough method involves a spiral incision through the skin down to the deep fascia, beginning at the saphenous opening and ending behind the internal malleolus. The spiral thus consists of two complete turns. The incision must divide even the small transparent veins lying on the fascia, and when the bleeding points, which are not numerous, have been ligatured the wound can be sutured. A bandage should be worn for a period after the operation. This procedure has the same objection as most others, that the patient has to remain some days in bed; but there can be no short and easy road to success in so intractable a condition, and the longest cut may prove to be the shortest in the end.

Treatment of Graves's Disease.

In the *Ohio State Medical Journal* for October, 1920, HOOVER asserts that the etiology of this disease is unknown. We have very strong evidence to show it is not thyrogenic, and about all the positive knowledge we have on the subject indicates that hyperthyroidism is not associated with the

disease. Should, however, the disease be thyrogenic in origin, it must be some form of dysthyroidism, but we have no direct evidence to indicate that dysthyroidism exists. Dysthyroidism up to the present moment is a mere fancy. As these patients are weak, and the ability for both mental and physical labor is very greatly reduced, the only clearly logical method of treatment is to give them rest. But what may be rest for one person is not rest for another. Confinement to bed may not amount to rest; it may be a mere annoyance. Confinement to bed may not mean rest to the patient any more than confinement in a strait-jacket will amount to rest. If the patient is discontented and unhappy, and is unwilling to coöperate on such a basis, rest will not be attained by confinement to bed. He recalls one patient with severe Graves's disease who grew decidedly worse after two weeks' confinement to bed. She was then allowed larger liberties and made a complete recovery. It may be necessary for many patients to abstain from active work over periods of one to five years, but the vast majority of them make good recoveries.

The use of the x -ray has received the approval of a number of writers within the past few years, but the results differ so little from those obtained by the observance of rest that he is disposed to look with much skepticism on the value of radiotherapy. It is a justifiable method of treatment and one which he employs, but thus far his experience has not been sufficiently reassuring to justify any announcement of decided success in the treatment of Graves's disease.

We must have a definite understanding of what we are treating in a case of Graves's disease. Are we treating the disease as an entity or are we treating a thyroid gland? The x -ray and iodine in various forms may be employed for the direct treatment of the thyroid gland, but it must not be understood that this treatment is directed against Graves's disease as a clinical entity. The only medical treatment which has seemed of value is

physical and mental rest. Such treatment allows very large interpretation on the part of the physician, and he who would treat such a patient with success must appeal to the reason of the patient; he must enlighten him in the character of the disease, and must be very artful in the employment of persuasion. In some instances symptoms may arise from the goitre, and in such cases surgical removal is advisable, but thus far he has been unable to see any justification for amputation of part of the thyroid gland as a direct treatment for Graves's disease.

In discussing the paper of Crile on this subject in the *Ohio State Medical Journal* for October, 1920, HAINES, of Cincinnati, calls attention to one very valuable method in dealing with the desperate cases. Boiling water when injected into the gland substance will be followed by a rapid subsidence of the symptoms of hyperthyroidism.

In one instance only, in his experience, has he been forced to this method; but prompt, permanent relief followed in a patient wherein one month had been spent in trying to get the patient in condition for operation. Rest in bed, x-ray, drugs, ice-cap over the heart, and ligation of three of the vessels under local anesthesia failed to bring this patient to a physical condition which his anesthetist considered safe for a general anesthetic.

After infiltrating the skin over one lobe with a .05 per cent of novocaine, a needle was introduced into the center of the lobe; the syringe was filled with boiling water, quickly attached to the needle and injected into the gland. More relief followed immediately after the injection of 60 Cc. of boiling water than had been obtained in one month's previous care.

Complete relief from all the symptoms followed similar treatment in the opposite lobe one week later. This patient has fully recovered except for a badly damaged heart.

The exophthalmos, tachycardia, nervousness, and jaundice subsided more promptly, as he remembers, than these symptoms do following removal of the gland.

Treatment of Recurrent Malaria by Novarsenobenzol.

In the *Lancet* of September 11, 1920, D'ESTERRE states that so much has already been written as to the nature of malaria, the clinical and other characters of the disease, and the lines of treatment found to be most successful, that he proposes to touch only on a series of cases of recurrent malaria treated by him at the Third London General Hospital, by intramuscular injections of novarsenobenzol (neokharsivan). Having seen during the last three years at least 500 cases of recurrent malaria from all parts of the world, he was struck by the fact that in all these cases the usual varieties of routine quinine treatment (*i.e.*, by the mouth, intramuscular and intravenous) had been tried, in many cases pushed so far as to produce temporary blindness and deafness, and yet upon arrival in England the patients were still suffering from the disease, as shown by blood smears and a differential count. He therefore decided to venture on another line of treatment.

His reasons for using novarsenobenzol were: (1) Because it has been conclusively proved that the malarial fevers are protozoal infections, infecting the red corpuscles of mammals, reptiles, and birds. (2) Because the organic compounds of arsenic in its trivalent form are more potent in action upon protozoa. (3) Because it is known to destroy the *Spirochæta pallida*, the balance of opinion now being distinctly in favor of the *Spirochæta pallida* being a protozoön.

The reason why the spirochætes vanish so quickly after salvarsan, or neokharsivan, is that they contain free OH groups, since in their colloidal lipid membrane an unsaturated fatty acid exists. It is to these OH groups that the metals become attached, with the result that the organisms perish. He hoped, therefore, the same result might take place with the malarial parasite.

The preparation used was novarsenobenzol, which is easily soluble in water, yielding a neutral solution suitable for intramuscular or intravenous injection. The

first two injections consisted of 0.3 g. in 5 Cc. 0.5 per cent sterile saline, and the last two injections of 0.4 g. in 7 Cc. 0.5 per cent sterile saline. These injections are given at intervals of one week. A line is drawn backward from the anterior superior iliac spine to the top of the natal fold; this line is divided into three equal parts; the point of intersection of the upper and middle third is the site of injection. All the usual antiseptic precautions should be taken with regard to the sterilization of needles and syringe. The night before treatment the patient is given a laxative, the following morning, three hours before the injection, he is given a light breakfast, and the food on that day should be light so as to throw as little strain as possible on the digestive organs during the elimination of arsenic. The patient should stay in bed for at least three hours after the injection, and in order to prevent any after-pains or reactive painful infiltration hydropathic measures such as moist compresses, hip-baths, or the application of a hot-water bottle may be employed.

If the pain is very severe he gives the following powder, which he finds efficacious: Pyramidon, 10 gr.; medinal, 3 gr.; heroin hydrochloride, 1/12 gr. In between the injections the patient is given small doses of quinine.

In all cases an examination of the blood is made before each injection with regard to the presence of the malarial parasite, and a differential blood count to ascertain especially any increase of the large mononuclears. This is a very important feature, as in cases in which the parasite cannot be demonstrated in the blood the mononuclear reaction, along with the presence of pigment in the mononuclear cells (due to phagocytosis of pigment formed by the parasites), has been taken as evidence that the case is one of malaria. The mononuclear reaction is especially interesting from the fact that in other protozoal diseases an activity of the same elements has been observed.

He says that only three out of thirty-eight patients have reported "They think

they have had a slight attack" since leaving the hospital.

Personally d'Esterre is very much gratified with the results and regrets that he did not keep more records. In cases in which it was doubtful if the malarial parasite existed in the blood he tried a provocative dose, and in several cases the desired result was obtained. He suggests that even two weeks after the blood gave a negative test, a mild provocative dose be given to ascertain whether a cure has been effected. If the disease is found to be latent a second course lasting another four weeks would be suggested.

Certain Points in the Diagnosis and Treatment of Pulmonary Tuberculosis.

In the *American Journal of the Medical Sciences* for September, 1920, BROWN states that a physician must have a sanguine temperament to deal successfully with this disease, for patient, family and friends all lose courage and grow despondent over the many disappointments that beset the path toward recovery. Bearing these facts in mind the psychologic treatment of the patient demands careful thought. Brown does not believe that it pays to temporize with the patient. He should be told at once that he has pulmonary tuberculosis. It may come as a shock and nearly prostrate the patient for a while, but the physician will be the gainer, and in the end the patient will be benefited. He does not and cannot know the difficulties ahead of him, and he doubts the advisability of emphasizing them too much at first. The patient should be told enough to gain his whole-souled coöperation and to awake in him a fighting spirit. Encourage him or depress him, or do both, but from the minute he is told of the diagnosis assume a strict attitude toward what he should do.

He emphasizes the benefits that many patients derive from proper treatment at its onset, and calls attention to the "danger time" that the patient passes through at the onset of treatment. He refers to the period

of time, usually several weeks, during which the education of the patient progresses to a point where he becomes orientated and aware of the many dangers that follow overexertion. Brown knows of no way more certain to avoid these dangers than to keep the patient in bed on a porch or in a room with wide-open windows until his education has progressed to a point that you can trust him not to overdo. He is to be told that he has specks on his lungs like those that occur in apples in March, and that while the apple must necessarily decay in order to liberate the seeds, his lung is constantly forming delicate scar tissue about these specks or tubercles which contain the germs, in an endeavor to wall them off, and, so to speak, strangle the germ in its own juices or excretions. Also that at first the scar tissue is so delicate that it resembles spider web, and that vigorous or violent respiratory exertions may stretch the delicate scar, liberate some germs which may form new specks or spots, which in turn will have to be walled off before he can hope for recovery. In short, the treatment of pulmonary tuberculosis depends upon two things: (1) the formation of scar tissue, and (2) the protection of the forming scar tissue. The conservation of energy and the conservation of natural resources are familiar to many patients. Tell them rest enables their body to devote more of its powers to form scar tissue and rest of the lungs protects the delicate scars.

In recent years Brown has come to regard rest as the most important point in the treatment of pulmonary tuberculosis. It is far better for a patient to be in bed in a room with fair ventilation for several weeks than to dress and to walk some blocks to a park where he can sit out for several hours and climb several flights of stairs to regain his room. If one can persuade his patient to do this, seize upon the opportunity to educate him. Put such literature in his hands as he can comprehend and encourage him to write down questions. Tell him frankly that your visits are as important educationally as medically. If one can get him to think out his problem, three-

fourths of the battle is won. Brown usually tries to keep afebrile patients in bed six weeks. Patients with fever demand much longer periods of rest.

Exercise at the proper time is as important as rest, but even then vastly more dangerous. The scar, of course, at the end of six weeks is not densely fibrous and requires careful stretching, such as is exerted by gentle breathing. Brown does not refer to respiratory exercises, which he seldom uses. To reëducate the patient physically requires that the physician should become a physical trainer, who never forgets that he is dealing with a damaged organ that demands far more rest than a normal organ. This, too, must be impressed upon the patient. He sometimes puts it that they can play and get well or work and get well, but they cannot work and play and get well. To watch the effect of any new form of exercise, have the patient take it every other day. It has seemed that afebrile patients kept in bed six weeks could be given exercise rather early. Brown frequently allows them to take, after they are accustomed to dressing, to going to meals and to climbing the necessary flight of stairs, one-quarter of an hour's slow walking twice a day the first week, one-half the second, three-quarters the third, and one hour the fourth, provided, of course, there has been no increase of symptoms. After that if he feels that he can trust the patient he puts him on unlimited exercise and tells him never to get out of breath or to get tired. Of course, many patients do not advance this rapidly, and remain at fifteen to thirty minutes twice daily for some weeks. Such treatment is applicable only to early and favorable cases.

Since the first century of the present era, and possibly before, air or climate has been extolled in the treatment of pulmonary tuberculosis. The oxygen of the air enters the body through the lungs. So air is necessary to the lungs, it has been argued, and bad air would therefore affect the lungs deleteriously. Hence the value of good air for the diseased lungs. Curiously enough the lungs can use and do well in air in

which a man cannot live. The value of live, fresh air lies not in its effect upon the lungs, but through the effect upon the body in general. It affects the lungs no more, no less, than the knee. The value of air is exerted in what might be called the air bath. He refers to having fresh air circulate about the patient. It is better, of course, to have him out-of-doors, but Brown thinks it is better to be indoors with open windows than overexercising to get fresh air. Window tents that expose the head and neck while the body is in a warm and possibly badly ventilated room produce the same effect in pulmonary tuberculosis as spraying the face and neck in typhoid fever. Both are good as far as they go, but they stop short of the essential.

Food requirements in pulmonary tuberculosis have undergone considerable change. At first the patient was overfed, and now we realize that food has a specific object in this treatment and should be prescribed accordingly. The struggle against pulmonary tuberculosis is a fight to strengthen and to build up the recuperative powers within the individual patients. Scar tissue must be formed. Calcium salts must be deposited. The increased wear and tear of fever, which increases the caloric output of the body by 50 per cent, must be combated. At the same time such patients crave little food. The old idea was that patients needed much meat and milk. It is of interest to note that when after the war an attempt was made to put flesh on some Germans by greatly increasing their fats and carbohydrates it could not be done until an excess of meat was added to the diet. It seems that extra meat is necessary until the patient has a proper amount of protein in his body. If excess of calcium salts are necessary no food furnishes such an amount of this dietary essential as milk, combined, too, in such a way that it can be used at once by the body. The fact that the calcium content of the blood serum does not vary in pulmonary tuberculosis is no argument in his mind against its use. One may recall that the same argument was used against the use of iron salts in anemia. Is

it not possible that with an increased amount of calcium in the food the blood may pass on to the tissues or scar formation an increased amount of calcium? With a judicious use of milk there is no call for any anxiety about a lack of fat-soluble vitamins in the diet of our patients, but it is of interest to note that cod-liver oil and butter-fats contain it in large quantities, while all vegetable oils and fats are deficient in it or lack it entirely. The water-soluble vitamin is practically always supplied in sufficient quantities.

Nasociliary Neuralgia.

SLUDER (*Medical Record*, Oct. 2, 1920) states that pain in the eyes, brow, and root of the nose is not infrequent. It is of various origins. Localization of the pain by the patient has not been precise. Pains of frontal, ethmoidal, or sphenoidal sinuses, or nasal (sphenopalatine, Meckel's ganglion), or supraorbital, or nasociliary nerve origin, may overlap in their sensations. This last pain was usually referred to the small district bounded by the superciliary ridge above the superorbital notch laterally, and the nasal bones below. Sometimes it extends to the tip of the nose; rarely it is referred to the eyes. Patients often complain that they cannot wear glasses because of soreness of the nasal bones. Severe pain, however, of whatever origin, may be referred beyond these limits. Pain of supraorbital neuralgia is more wide-spread. Pain of suppuration of the frontal or ethmoidal sinuses under pressure is of long-known recognition. Pain of vacuum frontal sinus origin was first described in 1900. Pain of nasal ganglion origin, referred to this district, was described in 1907; it is usually accompanied by other painful sensations. Pain of sphenoidal origin referred to this district was described in 1912; it, too, is usually accompanied by other painful sensations. Pain of supraorbital systemic toxic neuralgia is of classical description.

After describing the nervous anatomy of the parts Sluder said that this showed that

the nasociliary nerve was quite near the surface of the membrane, and was more superficial than the nasal ganglion and was more easily cocaineized than the nasal ganglion. A small applicator with 20-per-cent solution sufficed. This was passed upward on the inside of the nose, being held forward in contact with the anterior limit of the nasal fossa until it reached the roof of the fossa. By this procedure it arrived automatically in the apex of the angle formed by the cribriform plate above and the anterior limit of the nasal fossa. At this point the nasociliary nerve entered the nasal fossa. When the pain in this region was of nasociliary origin such an application of cocaine would stop it in a few minutes. Should it be of the other origins mentioned above, it would not be influenced by such an application. The differential diagnosis would furthermore reveal a tender spot in the floor of the frontal sinus if it was a case of vacuum or purulent frontal

sinus origin (Ewing's sign). His observation so far has been that nasociliary neuralgia has usually been a transitory phenomenon in the course of cases which had been under observation or treatment for something else. The nasociliary neuralgia would appear from time to time in the course of other clinical conditions, and was usually not obstinate. It would yield to cocaineization and applications of dilute carbolic acid. Four times, however, he had seen it the only clinical phenomenon. Once he had injected the nerve trunk at its entrance into the nose, with relief to the patient. The technique was that first advocated by Stein in his alcohol injection treatment of hyperesthetic rhinitis. A straight needle was passed upward in the nose in the same way as the applicator for cocaineization and a few drops of 95-per-cent alcohol with 5-per-cent phenol was instilled into the nerve trunk at its exit from the ethmoidal slit.

Surgical and Genito-Urinary Therapeutics

Appendicostomy and Cecostomy for Intestinal Stasis in Epilepsy and Neurasthenia.

WHITE (*American Journal of the Medical Sciences*, August, 1920) reports cases thus treated, holding that a long, thorough medical treatment under the best conditions should precede any thought of surgical methods.

Other things being equal, the greater the delay in emptying the colon the more suitable these cases are for surgery, but colon stasis is far from being the only factor to consider. The operation of cecostomy or appendicostomy is probably justified in carefully selected cases, but it is largely experimental at present.

Only a fraction of one per cent of cases of intestinal stasis are obstructive or organic, the rank and file are functional, atonic, and ptotic, and therefore appendicostomy or cecostomy was chosen for these

patients in preference to colectomy, because they are much simpler operations, and more suited to the simpler type of non-obstructive case. They are free from the objections of the short-circuiting operations and are far less serious than a right colectomy.

There are some purely local after-effects of this type of operation which may be important in neurotic and sensitive persons. There is often a disagreeable amount of fatigue and disability in a nervous woman from any operation whatever, which may last for weeks or months. In addition any colostomy may be disagreeable, there may be some local irritation, a little pus discharge about the wound, slight odors, some local pain at first so they cannot walk about—all of which are disagreeable to a sensitive woman. The after-effect must be good enough to overcome all these features.

The actual results of the operation and

subsequent lavage are difficult to judge in this class of patients; the firm belief of the patient that something definite is being done to help has a marked effect, which is purely psychic; and we must also remember that a remission of epileptic attacks may follow any surgical operation of whatever sort.

The immediate effects of the operation were not important in most of the cases and the convalescence was reasonably prompt and easy. In one neurasthenic patient the immediate effects were trying. For several months after the operation she was very nervous and tired, and there was considerable local irritation from the wound which prevented walking about.

The late results have been as follows: Both neurasthenic patients considered the operation a real help; in one a definite improvement in symptoms, such as headache, dulness, and fatigue, occurred; intestinal gas, formerly very troublesome, almost disappeared; sleep improved; attacks of depression disappeared. In the other neurasthenic case, while the operation was very simple and easy and convalescence rapid, the end-result was not satisfactory. The patient had many nervous and mental symptoms and could not be said to be really improved at all in spite of the fact that the irrigation was very simple and easy and thorough, and in this patient the mental condition was for a time precarious. After ten months the patient complained much of discomfort in the neighborhood of the opening and also from the dressings, so the appendix was removed and the abdomen closed. Her mental condition has continued to improve slowly under careful sanitarium treatment.

The results in the epileptic cases were as follows: In the first patient, who has also chronic nephritis and who had been having attacks three or four times a year, the attacks entirely stopped for a period of eight months after the operation. Since that time they have occurred again in a slightly milder form than before and rather more frequently than before; the two at-

tacks in the last six months have been very mild.

The other epileptic patient, a more serious case, in whom the attacks were frequent and severe before operation, averaging one to a month, had no attacks for two months after operation; then the attacks continued just as often as before, though some were not as severe.

There have been no marked changes in physical signs in any of these cases, except that one patient gained 15 pounds. Two patients were recently examined to see if the action of the colon had become more prompt and satisfactory than before. The author tried to judge of this by a Roentgen-ray examination, and it was found that, when examined at the end of thirty-six hours, the food and barium had made better progress through the intestine than before the operation, and that the right side of the colon was much better emptied out. Both patients, however, were somewhat behind the average normal schedule for emptying the colon.

Paths of Spread of Bacterial Exotoxins.

TEALE and EMBLETON (*Journal of the Royal Army Medical Corps*, August, 1920) as the result of a laboratory study conclude that although tetanus toxin ascends to the central nervous system by way of the axis cylinders of the nerves, it also to a very great extent passes up the nerves to the cord by the way of the perineural lymphatics. Blocking of the latter paths greatly delays and in some cases completely prevents the occurrence of tetanus in the part corresponding to the nerve whose lymph path has been blocked.

Although tetanus toxin passes rapidly from the blood-vessels into the connective tissue spaces and thence to the thoracic duct, the toxin does not pass from the capillaries of the central nervous system to the tissues thereof.

Tetanus toxin does not pass from the choroidal plexus to the cerebrospinal fluid.

Although bacteria can pass through the

posterior root ganglion to the cord, colloidal pigments and tetanus toxin are prevented from doing so.

Iodine, although it prevents tetanus toxin from producing its characteristic effects when iodized toxin is inoculated subcutaneously or intravenously, does not affect the toxin when inoculated intracerebrally, it does not hinder the occurrence of the typical symptoms of cerebral tetanus, and there is no apparent diminution in its toxicity.

Tetanus antitoxin does not pass to the central nervous system either by way of the blood-vessels, axis cylinders, or neural lymphatic channels. It also cannot pass from the cerebrospinal fluid when inoculated intrathecally into the substance of the cord. The antitoxin simply acts by combining with the circulating toxin, and that at the seat of production, and prevents it from reaching the central nervous system.

Roentgen-Ray Burns.

WITHERBEE (*American Journal of the Medical Sciences*, August, 1920) states that the maximum number of exposures in a given case that can be made without producing a Roentgen-ray burn, an erythema, or a temporary or permanent alopecia can be obtained by the formula used for determining unfiltered dosage. The principle of this formula is based upon the fact that Roentgen-ray burns, alopecia, etc., depend entirely on the quantity of a Roentgen ray reaching the skin, as pointed out by Remer and Witherbee in June, 1917. He gives the formula in detail and the practical method of using it. He states that it is obvious that the head, kidney, bladder, pelvis and lumbar spine are the regions that require the larger doses to obtain results. If a case of this kind is passed on from one Roentgen-ray laboratory to another, in a comparatively short time, and standard exposures made in each place, a Roentgen-ray burn may occur.

Roentgenologists, and especially those who specialize in the branches in which

these large doses are required to obtain good plates, would appreciate a complete Roentgen-ray history as well as clinical history of these cases. By a complete Roentgen-ray history is meant the time the plates were taken, the position of the patient, the factors used in making the exposures, and the date of the last examination. With these data the roentgenologist could determine at once how soon it would be safe to proceed with his examination, instead of waiting three or four weeks from the date of the last exposure in order to avoid either increasing an already produced burn or adding enough more to produce one that otherwise would be a safe and sane exposure.

Erythema appears in from ten to fourteen days, so that at the end of three weeks one is safe in concluding, if the skin appears normal, that the exposure the patient has had was not sufficient to produce an erythema. But the dose may have been of such intensity that by adding the large amount necessary for the second examination may induce an alopecia or erythema by the combined exposure. If an erythema or temporary alopecia has occurred during the third week after the first examination it would seem advisable to wait at least six weeks from the date of the last exposure.

From a medicolegal standpoint it would seem assured that the defendant would be in a much better position to defend himself if he knew his factors and the valuation of the same in determining the cause of Roentgen-ray burns.

Hemorrhage Following Hemorrhoid Operation.

GABRIEL (*Lancet*, July 17, 1920) upon an analysis of 500 cases of internal hemorrhoids operated on at St. Mark's Hospital in the course of the last sixteen months states that ligature was employed in 470 cases, clamp and cautery method on 18, the Whitehead operation on 12.

Four hundred and eight ligature cases gave him two postoperative bleedings within eight days, and eleven usually occur-

ring at the end of a week. Eighteen cases of clamp and cautery gave him one slight hemorrhage one day after operation. The Whitehead gave him one slight hemorrhage.

What he calls the intermediate hemorrhage, that is recurring within one or two days of operation, is caused by the slipping of a ligature, or by persistent bleeding from a small vessel not ligated at the time of operation, or in which the thrombus has become loosened as the result of coughing, vomiting or straining at micturition. In each case there was considerable oozing during the night following operation, necessitating one or more changes of the outer dressing, requiring active treatment in the morning. Hypodermic injections of morphine were given with general treatment, and the bleeding was controlled efficiently in each case by plugging the rectum. A vulcanite tube was inserted in two cases; the third was plugged with a rubber tube and a wool "surround." The tubes were removed after twenty-four hours, and no further bleeding occurred.

The routine injection of 5 ounces of sterile olive oil was given into the rectum on the second evening after operation, and castor oil 1 ounce was administered orally on the third morning.

The operative technique is the most important factor in the avoidance of intermediate hemorrhage. In the ligature operation in particular, care should be taken to keep the scissors accurately in the submucous plane in order to avoid dividing vessels unnecessarily; the distal portions of the ligated piles may be left *in situ*, or, if part is cut away, an ample amount should be left to insure that no slipping of the ligature can take place.

Secondary hemorrhage is an uncommon complication which cannot be anticipated, and unless the possibility of its occurrence is kept in mind, a large concealed hemorrhage may occur before the condition is recognized. In this series five cases of serious secondary hemorrhage followed a ligature operation, four on the seventh and one on the eighth day after operation. In

addition there were eight other cases of slight secondary hemorrhage after defecation, of no special consequence and requiring very little treatment; seven of these followed a ligature operation.

A secondary hemorrhage is brought about by premature separation of the sloughing pile. After the ligature operation the ligatures separate normally between eight and twelve days after operation. In this series the average date of the secondary hemorrhage has been seven days after operation. The chief factors in the causation of the hemorrhage are: (1) infection, (2) trauma, (3) anemia and general debility. To these may be added, rarely, blood diseases such as hemophilia.

Concerning the symptoms of hemorrhage it is important to note that in the author's cases there were no premonitory symptoms in these five cases of severe secondary hemorrhage. The relation of defecation to the hemorrhage varied, but usually the bleeding first occurred at or immediately following defecation. The only local sign was usually a slight intermittent or continuous trickling of blood from the anus, giving absolutely no indication as to the size of the hemorrhage concealed. In one case a constant tenesmus was complained of, the patient straining down and passing fluid and clotted blood at short intervals. Local pain was usually present, possibly caused by the tension of blood in the rectum, the sphincter being always tightly contracted.

Each case presented to a varying degree the general evidences of loss of blood.

If a patient passes a small amount of blood with a stool, he should be confined to bed until the next stool and watched. If there is a small, continuous oozing of blood from the rectum, or a slight recurring hemorrhage at stool, or the least suspicion of any of the recognized symptoms of hemorrhage, the insertion of a speculum will infallibly demonstrate whether or not there is bleeding into the rectum with retention.

A Kelly speculum is sterilized, and after lubrication with sterile vaselin is passed

gently into the rectum; on withdrawal of the obturator a concealed secondary hemorrhage, if present, is at once made apparent. A finger passed into the rectum gives no information of any value, and the passage of a small drainage-tube for diagnostic purposes is not to be recommended, since it is liable to be obstructed with blood-clot. The tubular speculum affords the most certain diagnosis.

The lower rectum should be irrigated with one or two pints of normal saline or lysol solution at 110° F. A light is then directed into the speculum, and an attempt is made to localize the bleeding vessel. The sloughs resulting from the operation are usually still present, and, together with the ligatures and entangled blood-clot, make identification of the vessel difficult. The bleeding was definitely arterial in each of the cases of large hemorrhage, but in only one instance was the writer able to find the bleeding point; this patient was anesthetized and the vessel ligated. The remaining four cases were treated by plugging the rectum; this proved efficient and should be successful in all cases; it is easier and quicker than ligation of the vessel, which has to be done under general anesthesia and is rarely practicable.

The Results of Surgical Treatment of Exophthalmic Goitre.

JUDD (*New York State Journal of Medicine*, September, 1920) observes that in outlining the treatment for hyperthyroidism it must be remembered that the disease occurs in attacks. A careful consideration of the relative time of the attack gives a suggestion as to how the treatment should be carried out. The time of instituting surgical treatment is the most important factor in estimating the immediate and the ultimate results. Although the degree of hyperthyroidism may not seem excessive, if the symptoms are quite rapidly increasing in severity—that is, if the nervousness is progressing and strength and weight are decreasing—the patient is on the downward

wave of an attack, and no radical surgery should be undertaken at this time.

The high mortality of the early operations for hyperthyroidism was due largely to the fact that the operation was undertaken when the disease was progressing rapidly; it was believed that unless something was done to abate the condition it would go on to a fatal termination. It is true that fatalities will occur in some cases regardless of the treatment employed, but all cases considered, more patients will be saved if the simple palliative measures are resorted to during the progress of the attack, instead of the radical operation. Many more patients will eventually recover if they are carried over the climax of the attack by rest, increasing elimination, hot water and quinine-urea injections into the thyroid gland, and ligation of one or more of the thyroid vessels. Ligation of these vessels helps more than any of the other palliative measures, but it must not be done in the most extreme cases, at least not until the simple procedures have been tried. All of these measures must be considered as palliative, and should be used only with the idea of temporizing during the particular attack.

Until recently we depended entirely on the clinical picture and physical findings by which to estimate the degree of toxicity in the cases of hyperthyroidism, but in the past few years it has been shown that the toxicity may be measured accurately by the changes produced in the basal metabolic rate. The basal metabolic rate is always increased in cases of hyperthyroidism, and decreased in cases of hypothyroidism. While some unknown factors may enter into the problem of hyperthyroidism the changes in the metabolic rate are characteristic and give an accurate method for the determination and estimation of the degree of thyroid toxicity.

For practical purposes, in deciding the plan to follow in the treatment of a case of hyperthyroidism, a study of the clinical features is most important. Usually the metabolic rate is increased in the propor-

tion indicated by the clinical symptoms, so that the degree of hyperthyroidism estimated by clinical features and by the metabolic rate is the same. In certain cases, however, the two do not coincide; for instance, the pulse rate may be so high as to indicate a marked degree of hyperthyroidism, and the metabolic rate may not be high, or the converse may be true. If these findings do not agree the palliative measures should be employed first, even at the risk of being too conservative. The basal metabolic rate, accurately determined, is a very definite estimate of the disturbance in the thyroid, and is of great assistance in estimating the degree of hyperthyroidism and hypothyroidism. In the future it will be very valuable in a study of the results of the treatment of these conditions.

No specific medication has had any definite influence in hyperthyroidism, although a systematic course of rest, increase of elimination, and a regular diet may have such a marked influence on the progress of the toxemia that the patient will eventually almost recover. Beside this so-called rest treatment, a great deal has been claimed of late for the Roentgen-ray and radium treatment. Judd's experience in these cases has been largely with the surgical treatment, but the rest treatment has been employed in many cases, sometimes over a long period of time, and in a number of instances radiotherapy has been added. So far the results of these conservative methods have been helpful and encouraging up to a certain point.

The importance of removing the gland in the fairly early stages is becoming manifest since it prevents the gradual development of some of the terminal conditions which frequently occur in these cases and which prevent complete cure. By means of thyroidectomy changed thyroid tissue is removed which could not return to normal.

It is difficult to determine the time when these patients may be called cured, or when they will have no further relapses. It will require studies of series of cases some years after treatment to learn the effect of the

treatment and the ultimate results; and it may be necessary to have the metabolic rate estimated to be sure that there is absolute freedom from the influence of a disturbed thyroid.

A few instances have been reported in the literature of results in a series of cases a number of years after the treatment. Means and Aud, in a recent article, have shown in detail the influence of x -ray treatment. Their results were estimated largely by metabolic studies, and were compared with a series of cases in which surgical treatment had been given. They concluded that results from x -ray treatment are more satisfactory since there were no fatal cases, and that ultimately, especially as far as the metabolic rate was concerned, the results were about the same as in cases in which operation was done. The report is interesting and seems to show that the x -ray has some influence on thyroid activity.

Mortality following surgical treatment is due principally to an increased hyperthyroidism which occurs in spite of treatment. There is practically always an increase in the hyperthyroidism immediately after operation. Patients who come for treatment while they are at the height of an attack or who are getting rapidly worse are not good surgical risks, and it is best to try to carry them past the crisis before operation. A review of Judd's early cases is interesting in showing that most patients who did not survive the operation were those who were operated on at the time of a crisis. Unfortunately, however, not all patients will survive if they are not operated on. In our experience some patients grow progressively worse in spite of treatment, and each year a number of patients are treated in which we are unable to stop the progression of the toxemia. A larger percentage of patients die at this time if they are operated on than if they are treated by rest and increased elimination. Some mortality in hyperthyroidism is unavoidable.

Judd with the help of Dr. Arnold Jackson has recently reviewed, as accurately as possible, the results obtained in 100 consecutive cases of hyperthyroidism in which op-

eration was done in the year 1914. The present condition of the patient had to be estimated, to a certain extent, from replies to letters, although many of the patients had been seen and examined repeatedly since their operations. The mortality in the cases in which a thyroidectomy was performed was 2 per cent.

Of this group of 100 consecutive patients operated on in 1914, Judd has been able to trace more than 90 per cent. Sixty-six per cent of these are free from all signs of the disease, at least six years after the operation. Similar findings were noted several years ago in a report of their patients operated on in 1909. In both instances, besides the patients who were completely cured, there were a number who were free from all symptoms of the disease most of the time, or they were so much improved that they considered themselves practically well, although they had some evidence of hyperthyroidism. Apparently the last symptom to disappear is the exophthalmos, which is present in about 70 per cent of the cases before treatment. Slight nervousness persists for some time after most other symptoms have disappeared. In addition to the 66 per cent of patients who were cured, 13.5 per cent reported that they were markedly improved, and 5.5 per cent that they were slightly improved. Metabolic studies were not made of these patients before operation. Eleven of the 100 patients died after leaving the clinic. Most of the patients were much better for some time, and were apparently cured of their hyperthyroidism. Several, however, died in relapsing attacks.

It happened that not one of the 100 consecutive operations performed in the beginning of 1914 was a secondary thyroidectomy for a recurrence. During the entire year, however, 387 operations were performed for exophthalmic goitre; fifteen (3.8 per cent) were secondary thyroidectomies for recurrences that had taken place within an average of twenty-two months after the primary thyroidectomy.

The series studied in 1909 showed only 45.4 per cent cures; in the series in 1914,

66 per cent were cured. A possible explanation of this difference is that in the later series of cases more than one lobe of the gland was removed. Judd feels sure that the subtotal thyroidectomy now performed will produce much better immediate and ultimate results than were formerly obtained by the lobectomy.

Those especially interested in the medical treatment of goitre have commented adversely on the cosmetic results of these operations. This criticism was a just one some years ago, but modern technique has improved greatly, both with regard to the manner of making the cervical incision and the manner in which the different tissues of the incision are closed, so that the scar following an operation for goitre is usually much less conspicuous than it was formerly. It is not nearly so noticeable as a slight enlargement in the thyroid gland which usually occurs following any other form of treatment, and should not be considered a contraindication to operation. One distinct advantage of subtotal thyroidectomy over lobectomy is that it leaves a symmetrical scar. Lobectomy should only be performed in those cases in which a subtotal thyroidectomy would seem to be too severe a procedure for one stage. In the very severe cases, especially those in which the toxemia has resulted in a dilatation of the heart with broken compensation, lobectomy should first be done on one side, and then on the other, as soon as the reaction from the first procedure has subsided. Just enough thyroid tissue should be saved to maintain normal function.

Cancer of the Bladder.

SQUIER (*International Journal of Surgery*, August, 1920) calls attention to the fact that untreated cancer of the bladder has a mortality of 100 per cent. When operated upon, nearly always late, the immediate postoperative death-rate will be somewhere between 20 to 40 per cent, but some few cases recover and remain well for years. He prefers knife incision to cautery.

Barringer reports a case of cancer of the

bladder treated by radium. The first operation was in 1917. It was probably casual. The operator's name is not given. There was rapid recurrence. He was therefore fulgurated a number of times. Eighteen months after his first operation he had complete retention of urine requiring catheterization. A tumor the size of an orange was removed through a suprapubic opening. The seat of this tumor was cauterized and planted with radium seeds—i.e., little glass tubes of radium emanation as large as the sharp end of a pin and about one-sixteenth of an inch long. These were placed in a needle which was forced into the base of the tumor and the tubes were left there. One dose of radium was administered through the suprapubic wound. The patient recovered and left the hospital, and has been well for a year and has gained 71 pounds. There are a few very small papillary growths within his urethra. They look like simple papillomatous growths.

Hyman records three cases of cancer of the bladder treated by excision. The first case was operated on in 1916 and remained well ever since, though this required resection of the ureteral orifice. The third patient lived for three years.

Hyman emphasizes the following points of technique:

First, a large median incision from the umbilicus to the symphysis.

Second, free mobilization of the bladder so that it can be brought out on the abdominal wall. All this is done extraperitoneally.

The third point is not to open the bladder until it has been fully mobilized. Then it is important to pack off the wound carefully, so as to avoid the danger of implants from the growth. He prefers to open the bladder without distending it with fluid, so that there will be no leakage of infected contents with the danger of spreading carcinomatous cells around.

The bladder is opened with the cautery and the growth thoroughly cauterized. Finally, after the tumor has been widely resected (also with the cautery), the edges of the bladder wound are again seared and

the bladder and abdominal wound are flushed with 75-per-cent alcohol. The edges of the bladder incision are inverted and closed with two layers of sutures, allowing space for a drainage tube.

Operative and Non-operative Treatment of Tuberculosis of the Spine.

STONE (*Journal of the Missouri State Medical Association*, September, 1920) was largely impressed by the obvious success of bone graft in these cases. He states that it was felt that at last a real means for preventing terrible hunchbacks and curing spondylitis had been found; but gradually a little doubt began to creep into his mind, and as time went on it became a conviction. Operative cases were not doing as marvelously as reports had led him to believe they would.

It must be distinctly kept in mind that in this paper he is considering only children who have not passed fourteen years. This age was not set arbitrarily to exclude any certain group, but for scientific purposes. In the dispensary fourteen years is the limit for pediatrics, nor is any one over this age admitted to the Children's Hospital.

The total number of cases reviewed is sixty-five. Thirty-three were operated on in one way or another, while the remaining thirty-two received what Stone called conservative treatment. Many cases treated have been excluded because they have been under his care an insufficient length of time to make just comparison. The total number, sixty-five, is taken from the records during practically the same period of time.

Under this heading are included those children who were given support of various kinds and of recognized efficiency, according to the individual requirements of the child. If, when first seen and examined, the child presents only symptoms of beginning tuberculosis it is given a plaster jacket and restricted in its activities. The length of the jacket varies with the portion of the spine involved. The higher up the process the higher the jacket, covering shoulders, supporting the chin, or includ-

ing the head, if found necessary. Possibly some other contrivance is used to take the place of a head plaster when the destructive process is very high up.

The patients presenting very acute symptoms at first or later are kept recumbent on a gas-pipe frame or plaster bed, possibly with some form of traction, until such symptoms have subsided, then ambulatory care is instituted. In the later stage a simple back brace is given, and as the cure progresses this is left off at night and then for gradually increasing periods. No set length of time may be given for the continuance of treatment, and it is necessary at times to begin all over because of an exacerbation of symptoms.

No attempt has been made to go into this treatment in detail; it's an old story and may be read in any text-book on orthopedic surgery. However, it was thought best to outline briefly what is meant by the term "conservatism." Abscesses are taken care of as they develop.

These children number thirty-two and range from two to thirteen years of age. None have been considered in this classification unless treated over a long period of time. Eight of them had marked deformity when so-called healing had taken place. Ten others have kyphosities less deforming, while fourteen have what may be termed very good backs and a small kyphos.

One boy also had a tuberculous hip, and after being in what the author thought a fair condition following more than four years of care, came into the clinic after a three days' illness and died suddenly while in the clinic. No necropsy was obtained. Another, who had been under observation for a number of years (seven or eight), got so he had difficulty in walking. Being about seventeen years old and full of wisdom, he heeded not. Paraplegia came on. A long period of recumbency was necessary to bring about improvement. Six, or 18 $\frac{2}{3}$ per cent, had abscesses. This very closely approaches the percentage of 19.7 given for a series of 380 cases. The author has not deemed it necessary to state either the region or duration of the ensuing sinuses.

In the operative group are thirty-three. Eight cases were done according to the procedure of Hibbs, which consists of breaking down the spinous processes and destroying the articular surfaces of the laminae. Four of these eight had abscesses later. Twenty-four of the group were operated after the method described by Albee—that is, a bone graft was taken from the tibia and inserted into the split spinous processes of the vertebrae and anchored there. Ten of these twenty-four were later complicated by abscesses. One died of shock the day of the operation. Two died within three months of tuberculous meningitis. A fourth died a year after operation. Another child went to a different hospital, where, under anesthesia, a fairly large kyphos was forcibly straightened; the child died promptly, making a total of five deaths as against one. One developed total paralysis of both legs one and one-half years after operation.

The author learned immediately that cases operated on could not be let go without some kind of support. A very few were given braces and did nicely, but, as all know, some tuberculous spines get along very well with a small amount of care. There have been only a few cases in which support has not been necessary for three or more years. Three did remarkably well; one seen four years after support had been discontinued was in fine condition. The fact is care has had to be continued as if nothing had been done. Tracings were made to show that deformity had increased in some.

It may be asked, were not only the worst cases operated? No, such was not the fact, for children in good condition, either with small or large kyphos, were done as well as those who were in poor condition and had a deformity either small or large. Symptoms were not taken into consideration. It was thought this procedure was the best thing for them, and, where consent was obtainable, the operation was done. At least one child had done poorly, its general health being bad. The parents had not been coöperative. Consent was obtained

and a bone graft done. This one has improved steadily, three years after treatment with recumbency, plaster jackets and braces having been carried out.

In conclusion he states that about 19 per cent of Pott's disease treated in the usual way developed abscesses.

Fourteen, or over 42 per cent, of thirty-three operative cases had abscesses. Operation has not prevented increase in deformity. After-care must be carried out during as long a time following operation as if nothing had been done. Mortality of operative cases was 15 per cent. Ankylosing operation for tuberculous spine in children is not to be recommended.

The Induction of Premature Labor.

SIR JOHN PHILLIPS (*Lancet*, Oct. 9, 1920), after an interesting history of the induction of labor for the preservation of maternal and fetal life, speaks with some enthusiasm of laminaria tents which if kept in alcoholic solution 1 to 1000 remain aseptic over a long period. In the afternoon the laminaria tents are introduced into the cervix, from one to three of the long variety, fresh from the solution, and within 18 hours are removed, when the cervix will be found to admit a finger, also quite soft and dilatable, enabling one to insert, after a little digital dilatation under an anesthetic, a small de Ribes bag.

He summarizes his results in 161 cases, recording seven deaths of mothers and twenty-four of children. His maternal deaths were due to acute bronchitis (1), multiple fibroid with twins (1), contracted pelvis and acute yellow atrophy (1), ventrofixation and bilobing of uterus (1), placenta previa (1), acute albuminuria and eclampsia (2).

With regard to the maternal deaths, none of them can be attributed to the actual induction, as a fatal result would, in all probability, have occurred without the operation; induction of labor may therefore be looked upon as a procedure which, *per se*, should be unattended by any mortality.

The writer believes that in cases in which

rapid delivery in a primigravida is necessary, such as in puerperal convulsions and complete placenta previa, it would perhaps be preferable to perform Cæsarian section, but should the case be that of a multipara digital dilatation and a de Ribes bag would be the best course to pursue. If there is no urgency and the case can be taken deliberately, bougies, followed by digital dilatation or a de Ribes bag, is the preferable course.

The Open Method of Nitrous-Oxide-Oxygen Anesthesia.

GWATHMEY (*American Journal of Surgery*, October, 1920) calls this method "open" in contradistinction to the face mask and rubber bag method usually employed in administering nitrous oxide and oxygen, and in which air is excluded as far as possible. The "open method" referred to in this paper is the equivalent of the drop method of ether, the mask of which is usually so covered with towels that it is hard for an onlooker to understand why the term "open" is used in connection with it. Gwathmey's mask is also covered with towels, nevertheless the method seems to offer certain advantages over the usual closed method. It is not intended to take the place of the usual method of employing nitrous oxide and oxygen, but is offered as a substitute for the "open-drop" or any other method of administering ether, and also as an aid in anesthetizing certain patients to whom the closed method seems a burden.

A mask is used just twice the size of the Mayo mask, and is sufficiently large to hold a full inspiration of an adult. With a larger mask it might be possible to fully anesthetize a patient with the gases alone, although this is not desirable, if the theory of narcosis is correct. The open method may be used with any gas-oxygen machine, as all machines have attachments in which may be placed the additional medication needed with the open method.

The mask, upon which has been placed several layers of gauze, scented with the essence of orange or oils of bitter orange

peel, is placed in position and the patient told to breathe, through the mouth if possible, but in any easy and natural way. Under no circumstances should straps or holding bands be placed on the patient, either at this or any other time. If any sensory reflexes get through to the brain, requiring restraint, then we have not a true anesthesia, and the sooner we drop the agent or technique that requires this additional help and have our inhalation anesthetics approach the same perfection that is attained with good local or spinal analgesia, the better it will be for our patients and ourselves.

The objects of all methods of anesthesia, whether local, regional, or general, are to isolate the brain during the operation, and to leave the patient in such condition that little or no reaction is possible afterward.

The anesthetic is started with three holes of nitrous oxide and one of oxygen; in ten or fifteen seconds the anesthesol valve is turned slightly, just enough to have the gases barely bubble through, and from this on it is very gradually increased until there is a slight bead on top of the liquid; time, one minute to a minute and one-half. The patient is now unconscious but not anesthetized. The technique from this on will vary with the substances to be used in connection with the nitrous oxide and oxygen. If only nitrous-oxide-oxygen and anesthesol are to be used, the anesthesol is turned on just a little more until the breathing of the patient is automatic, when it is turned back to the second position. The oxygen valve is now turned to the second hole and the oxygen and nitrous oxide remain thus proportioned throughout the operation, the depth of anesthesia being regulated by the anesthesol. Toward the close of the operation the anesthesol is turned off, and it will be found that the patient will be very easily kept under with the gases alone. Finally the nitrous oxide is turned off and the oxygen alone allowed to run for two or three minutes through the third and fourth holes, but not until the patient is entirely conscious. The mask is now removed, and within a few minutes the patient can answer questions intelli-

gently, but is best left undisturbed to sleep through the pain zone, which usually lasts from one to two hours. The return of the brain to its usual activity is as if from a quiet night's rest and with no reaction afterward.

The method just described is the simplest, and the management of the gases is the same throughout, but the technique may vary as follows:

If the second container holds ether, this valve is turned on slightly as the patient becomes unconscious, or at the end of a minute and one-half. If the swallowing reflex asserts itself, it is turned off again, and this movement is repeated until there is no swallowing reflex, when the ether is allowed to remain on. The anesthesol may be turned off at this time, and gas-oxygen-ether used throughout, or gas-oxygen-anesthesol and ether. If, instead of ether, the second container holds three to four drachms of paraldehyde, this valve may be turned on gradually to full at the end of a minute and a half and the anesthesol turned off. The nitrous-oxide-oxygen is allowed to blow over the top of the paraldehyde. If the narcosis becomes too light, the nitrous oxide may be increased for a short time, or the anesthesol may be turned on again, the narcosis being easily regulated in either of these ways. With any of these methods the patient's transition from consciousness to full surgical anesthesia is smooth and tranquil and the stage of excitement or struggling is omitted. The time required to reach full surgical anesthesia is from three to five minutes.

Paraldehyde combines very readily with nitrous oxide and oxygen, and while small amounts not over one drachm per hour are taken up when used as described above, this small amount makes an appreciable difference in the perfection of the anesthesia and in the comfort of the patient afterward. With any of the technique described the patient is fully oxygenated at all times, has a pink color from start to finish, and blood-pressure is even.

The theory upon which this special form of anesthesia depends is based upon the

fact that each of the agents used affects the nervous mechanism in a different place and in a different way, with a resultant anesthesia that is more nearly perfect than if any one agent is used.

It seems, from clinical experience, that the brain is better protected from shock or sensory impulses when a number of narcotics and anesthetics are used than when some single agent is employed. The following data would seem to prove this hypothesis. A certain dental specialist in New York City, who has extracted over 80,000 teeth during his professional career, uses a 50-per-cent mixture of paraldehyde and anesthol in connection with his nitrous oxide and oxygen, merely passing the nitrous oxide and oxygen over this mixture. Each patient gets in addition to the nitrous oxide and oxygen approximately 00 drops of paraldehyde, 00 drops of chloroform, 00 drops of ethyl chloride, and 00 drops of ether. This estimate is based upon the supposition that anesthol is what it is claimed to be, that it combines in stable chemical union 35.89 per cent of chloroform, 17 per cent of ethyl chloride, and 47.10 per cent of ether, with a boiling point of 40°C. (104°F.). The usual time of administration is one and a half minutes, with a resultant anesthesia so perfect that this dentist has one and a half minutes in which to do his work. Where formerly a large surcingle was used for certain classes of patients, athletes and alcoholics, for the protection of both patient and dentist, this has now been discarded and is never used. Not only is the resultant anesthesia more perfect than when the gases are used alone, but the patients leave the chair and walk from the room usually unassisted and without nausea, headache, or vomiting. This dentist states that under no consideration would he go back to the old method of using the gases alone. The new method is not only better for the patients, but this operator states that he himself walks from his office after a hard day's work feeling entirely different from the bedraggled condition in which he formerly lived.

The clinical experience of one with

80,000 cases to his credit cannot be discarded lightly. The open method of nitrous-oxide-ether or nitrous-oxide-oxygen-anesthol-ether can be used wherever oxygen-ether has been used in the past. Dr. Lombard, who uses oxygen-ether quite extensively, states that the average amount used with this method is three and one-half ounces per hour. Dr. J. C. Gates, of New York City, states that the average amount used with this method is one ounce of ether per hour in addition to the anesthol required in the induction. The principal objects in using this method are to abolish respiratory difficulties during operation by obtaining more complete relaxation than is usual with any closed method, and at the same time reduce to a minimum the disagreeable after-effects obtained with ether as usually administered. These objects have been in a very great measure realized; but the last word has not by any means been spoken either on this particular technique or on any other method or agent used. This method is merely offered as a simple, safe and efficient way for those who have not had the technical training necessary for the closed method, or for those who wish to improve their technique in administering ether, or who wish to test in a perfectly safe or sane way the theory annunciated in this paper, that a combination of narcotics and anesthetics isolates the brain from reflex stimuli more thoroughly than any other method of general inhalation anesthesia now in common use.

Removal of Missile from the Right Ventricle of the Heart, with Recovery.

LUCKETT (*Surgery, Gynecology and Obstetrics*, October, 1920) reports the case of a patient shot just before admission to the hospital. There was a penetrating wound of the first intercostal space of the left side, about three-fourths of an inch from the sternum. There was also a superficial seton wound two inches long in the left lumbar region, posteriorly. Examination of the lungs showed decreased breath sounds on

the left side. Examination of the heart negative. With oxygen injection in the abdomen, an *x*-ray picture was taken and indicated a missile in the heart. This was verified by fluoroscopy, which showed the foreign body pulsating. A five-inch incision was made in the sixth intercostal space, thoracotomy was done, and the wound held open by a Tuffier rib spreader. The missile was faintly palpated in the right side of the heart near the apex. There was no blood in the pleural cavity. The pericardium was opened on the left side. It was found to be free from blood. The heart was delivered through the pericardial incision and rotated forward from right to left and upward. A cut was made down to the missile, which was extracted; this was followed by a free gush of blood, controlled by catgut sutures. The pleural cavity was drained. There was no particular shock or any complication until the fourteenth day, when edema of the lungs developed. Later there was drainage from empyema. The patient made a complete recovery.

Cresol.

BEVERIDGE (*Lancet*, Oct. 2, 1920) states that the system of disinfection adopted in the German army was similar in many respects to the English and their allies, and hot-air disinfectors were largely used by them on the western front. In order to prevent the introduction of infectious disease into Germany from army fronts, the supreme command issued very stringent regulations by virtue of which all officers and men before entraining were required to proceed to a disinfection center, where they were inspected, bathed, and had all clothes and baggage submitted to disinfection. The time allowed for disinfection from the time of arrival of a train until departure of a "clean" train was limited to eight hours; all intercourse between the disinfected and those not disinfected was prohibited, and men were kept under medical observation for the remainder of the journey.

With regard to the use of chemical disinfectants, it is noteworthy that few are really necessary in war-time, even though their efficiency has been proved beyond doubt. It is well that this is so, for chemicals at all times are difficult to transport, requiring special packing, and many are also costly. In France disinfectants were sent up the line from base ports daily with the divisional pack, *i.e.*, the train carrying the daily rations, and found their way with the food to the divisional areas and the trenches themselves. It may be noted that reliance was placed upon three disinfectants—cresol, formaldehyde, and chloride of lime or bleach.

Cresol is probably the most valuable disinfectant for general use in the field; it has many advantages in addition to the ordinary use as a disinfectant. In hot solution it can be relied upon to kill lice and their ova. It has proved a valuable deodorant, and is also efficacious under certain conditions for the destruction of flies and their larvæ.

Major Mayne found that an emulsion of 1:100,000 was effective and imparted no objectionable taste to the water. Cresol has also been recommended for bilharzia-infected waters. It was used for staining floors and bedside tables with excellent effect. Cresol for use in the field was contained in drums, which drums served many useful purposes and were eagerly sought by sanitary sections.

The use of formaldehyde was chiefly confined to the spraying of infected premises, and for the destruction of flies, either by spraying or in solution in saucers placed in all kitchens and dining halls. At one period of the war great discomfort and even injury to health were caused among the men engaged in sorting and checking pay-books sent down from the battle-fields; these books were often soaked in blood and other discharges, and consequently were very objectionable to deal with. In addition to improvement of the ventilation of the rooms in which the men worked and other general measures, Beveridge had the pay-books submitted to the action of formaldehyde,

generated in a simply made chamber by means of potassium permanganate and formalin, with the result that all objectionable smell was completely removed and the men worked in comfort. This effect is due to the action of formaldehyde on protein matter and is one well worth remembering. The only disadvantages of formaldehyde are its irritating effects and its relatively high cost.

The third disinfectant, chloride of lime, was invaluable. It is necessary, however, that it be well protected from light, heat, and moisture, or it quickly fails in its effect through loss of the available chlorine on which its disinfecting properties depend. From the commencement of the war all water-supplies were disinfected by means of bleach or chlorine gas, and it was necessary that only the purest bleach should be

used for this purpose. Two grades were supplied—one for general disinfecting purposes, not necessarily of the purest, and the other put up in small tins for water purification, containing, according to specification, not less than 30 per cent of available chlorine. Bleach is unsuitable for use in hot climates, and in Mesopotamia had to be replaced by another halogen. The custom of sprinkling chloride of lime on the ground in unsavory places dies hard. If there is necessity to use a deodorant for such a purpose, then it is evident that sanitation has failed, and little is gained by hiding one smell by another. Chloride of lime was also invaluable for disinfecting and removing from effluents from ablution benches and laundries the soap which would otherwise have choked the soakage-pits into which they were discharged.

Reviews

SYPHILIS. By Loyd Thompson, Ph.G., M.D. Second edition, thoroughly revised. Lea & Febiger, Philadelphia, 1920. Price \$7.

As the author well says in his preface, the increase in our knowledge of syphilis during the last seventeen years finds no equal in the entire history of medicine. The advance began with the epoch-making work of Metchnikoff and Roux in transmitting syphilis to the lower animals, and the introduction of arsphenamine by Ehrlich placed in the hands of the profession a sharp tool with which they might carry out their work.

A very considerable part of this, the second, edition of Dr. Thompson's book is devoted to diagnosis and treatment, a fact which will appeal strongly to the practitioner in distinction from the laboratory worker. On the other hand it is to be noted that he by no means ignores the laboratory diagnosis of syphilis, recognizing the valuable aid which laboratory methods give us in the diagnosis of the disease and in the study of the effects of treatment.

Those who have seen the first edition of this book will remember that it is thorough and adequate. It begins with a chapter upon the history of syphilis in the old world and in the new, and the discussion of its importance both in the sense of its geographical distribution, its prevalence, and its economic importance. Altogether the volume contains 24 chapters, divided into three parts, the last part being devoted to congenital syphilis, while part two deals chiefly with syphilis of the various portions of the body in its acquired form. Fifty-three pages are devoted to the laboratory diagnosis and sixteen pages to the clinical diagnosis, but this does not give a fair idea of the discussion of diagnosis in full, for there is a preceding chapter containing fifty-seven pages upon the clinical history of the disease which is devoted to the symptomatology of acquired syphilis.

A copious bibliography is included by foot-notes on almost every page of the text.

We note with interest what the author has to say in regard to the comparative

value of mercury and arsphenamine. He quotes opposing views in regard to this matter and evidently reaches the conclusion which we believe has been generally accepted, namely, that arsphenamine is of the greatest value in combating what might be called the acute manifestations of syphilis, but that it has by no means driven mercury from the boards. Nevertheless he is evidently a friend of the newer drug, for he claims that the consensus of opinion of the majority of syphilologists is that arsphenamine is more potent than mercury and that most of the lesions of syphilis clear up more rapidly under the arsenic preparation than under the old remedy. Dr. Thompson is, however, sufficiently cautious to add that the time since the introduction of arsphenamine has been so comparatively short that definite conclusions from clinical evidence alone are not possible, although he believes that the laboratory evidence supports the claims for arsphenamine.

THE ENDOCRINES. By Samuel Wyllis Bandler, A.B., M.D. W. B. Saunders Company, Philadelphia, 1920. Price \$7.

Dr. Bandler, who is the Professor of Gynecology in the New York Post-Graduate Medical School, has been a frequent contributor to medical literature within recent times, devoting his articles to a consideration of the value of the endocrine glands derived from animals in the treatment of various functional and organic disorders in human beings. The present volume contains 486 pages, and, therefore, it is evident at once that the author feels that he has a large field to cover. Much that the book contains, however, is associated only indirectly with endocrinology. Thus, there is a chapter upon Environment and Heredity, another upon Instincts and Emotions, and still another upon Mental and Nervous Defects and Criminality, Neuroses and Psychoses, Phobias, etc. The majority of the chapters, however, deal definitely with the title of the book, and the reader will secure a great deal of information as to the results which Dr. Bandler thinks he has obtained by the use of these glands. About 120 pages are given

at the close of the book to reports of clinics at the Post-Graduate Hospital, in which cases were described and the results of glandular treatment were given.

The book is a distinctly personal one, not provided with a bibliography, and quoting other writers to a much less extent than is customary with authors dealing with this theme at the present time.

CHEMICAL PATHOLOGY. By H. Gideon Wells, Ph.D., M.D. Fourth edition revised and reset; 695 pages. W. B. Saunders Company, Philadelphia, 1920. Price \$7.

The first edition of this book appeared in 1907, and this, the fourth, edition has been so thoroughly revised that it was necessary to reset the type and even to recopyright it. It does not follow the path usually followed in books dealing with pathology, but as the word "chemical" indicates, it is a discussion of general pathology from the standpoint of the chemical processes involved. Thus one of the most important problems of the physiological chemist as well as for the active practitioner is the study of those disorders of nutrition associated with growth and repair and to which, in their serious forms, the term Deficiency Diseases has been applied. There is also being added to medical literature almost every month additional information in regard to the reaction of immunity, and for this reason in this edition the author has introduced a chapter upon "Anaphylaxis and Allergy."

The author recognizes that his text is one which should provide the investigator with suggestions as to lines of further investigation both in new fields and in completing evidence already in existence. In order that the more advanced character of the text may be understood, the author has deemed it proper to include a brief discussion of the elementary principles of physical chemistry and the fundamental principles of physics and chemistry of living cells discussed in an introductory chapter. He has called to his assistance Dr. Woodyatt to prepare and revise the chapter on diabetes.

A notable point in the book which we

would expect to find, because the author wishes it to be a guide to others, is the very copious bibliography dealing with the various subjects treated. Not infrequently 10 or 15 references are given on page after page as well as numerous bibliographical references at the end of chapters. The book is a most scholarly one and reveals extraordinary familiarity with the study of medical literature along these lines, both in this country and abroad.

A TEXT-BOOK OF NERVOUS DISEASES. By Charles L. Dana, A.M., M.D., LL.D. Ninth edition, illustrated. William Wood & Company, New York, 1920. Price \$6.50.

This standard book, which is now twenty-eight years old, renews its youth each time the author touches its pages for the purpose of revising it, and in renewing its youth maintains its usefulness. Unlike many other books, it has not increased materially in size with the appearance of many editions, which is a tribute to the fact that its learned author knows how to condense much valuable information and to eliminate that which has become archaic and useless. The author has prepared a chapter on Psychology in its various phases and another one on Endemic Encephalitis. He points out that his association with young and active neurologists has spurred him to keep the book thoroughly up to date, and he states that he has not given more space to endocrinology in relation to the nervous system because, as he well says, it is an illusive science and not yet in the form of a classified knowledge fit for presentation to students and practitioners. In other words, he recognizes the growing importance of endocrinology, but thinks that it is at the present time somewhat embryonic and uncertain.

COMMON INFECTIONS OF THE KIDNEYS. By Frank Kidd, M.D., B.C., F.R.C.S. (Eng.). With an additional lecture on the Bacteriology of the Urine, by Philip Pantom, M.D. The Oxford University Press, New York, 1920. Price \$7.25.

In a space of less than 350 pages Mr. Kidd, who is Surgeon in Charge of the Genito-Urinary Department of the London Hospital, deals with common infections of

the kidneys with particular reference to the colon bacillus and allied bacteria. His text is based upon a course of lectures delivered at the London Hospital, and he illustrates what he has to say by five colored plates and fifteen other illustrations, some of which show specimens and some of which are charts.

In his Preface he says "Bacteria are *not* the cause of bacterial infections." He makes "this statement deliberately so as to startle the minds of the bacteriologists out of the settled state of complacency into which they have sunk." He says that the study of bacteria has led medicine astray for the time being. His distinction is that bacteria are the exciting cause of the infection, which may seem a distinction without a difference. He also points out that many bacteria universally present in the throat, bowels and skin can become pathogenic under certain circumstances, which is especially true of the colon bacillus, the streptococcus, the staphylococcus, the pneumococcus, and numerous other micro-organisms. He points out that these organisms are daily invading the blood-stream and are being distributed throughout the tissues, afterward being got rid of by the excretory channels, and only exceptionally do they produce evil results. In other words, the whole object apparently of the author is to insist that centering our minds upon bacteriology we have studied the germ rather than the infected human being in the sense of having an eye to the predisposing causes which result in the patient falling a victim to infection.

The book is based upon his own large practical experience. After the preliminary chapters as to methods of examination and diagnosis we think that our readers will be most interested in the pathways by which the author believes that infection of the various genito-urinary organs occurs. The book is one which deals more largely with the clinical manifestations of disease than it does with its treatment, although in the case histories, of which there are a very large number, taking up a considerable portion of the book, the treatment which

was carried out in each instance is given. The book closes with a number of references to British and American literature which the author deems important.

JOHNS HOPKINS HOSPITAL REPORTS. Special Volume. Investigations of the Central Nervous System. By R. H. Clark, B.A., M.B.

Part I of this Special Report of less than 200 pages deals with the methods and instruments employed in investigating the nervous system, while Part II is made up of an Atlas of Photographs of the frontal sections of the cranium and brain of the Rhesus monkey. This second part is the combined contribution of Mr. Clark and E. E. Henderson, and comes from the laboratory of pathological chemistry of University College, London.

All men who are engaged in laboratory work dealing with the central nervous system will be interested in this publication, because it sums up for them an immense amount of valuable information gathered from other writers, and also because directions are given as to how experiments can be made, and how the animals which are used can be properly taken care of before and after the experiment, with information, also, as to what can be done toward studying and preserving the specimens which are gathered together.

COLLECTED PAPERS OF THE MAYO CLINIC. Edited by Mrs. M. H. Mellish. Volume XI, 1919. Published in September, 1920. The W. B. Saunders Company, Philadelphia, 1920. Cloth, price \$12.

In previous issues of the THERAPEUTIC GAZETTE we referred in terms of praise to these very excellent contributions which are made from time to time by the Mayo Clinic, not only to surgery but to medicine as well. The present volume contains no less than 1331 pages and is copiously illustrated. It deals, of course, largely with surgical propositions and with medical ones which are nearly related to surgical procedures. The richness of its contents makes one feel almost hopeless at the thought of being able to grasp all the points of value which it contains. In ad-

dition to dealing with matters which deal with practice in medicine and surgery, there are articles upon the Socialization of Medicine and of Law; The Educational Possibilities of the National Medical Museum and Graduate Medical Education in Great Britain and France; and there is an account of the Memorial Meeting in honor of Sir William Osler, which was held by the staff in the Mayo Clinic on New Year's eve, 1919.

A MANUAL OF PATHOLOGY. By Guthrie McConnell, M.D. Fourth edition. W. B. Saunders Company, Philadelphia, 1920. Price \$4.50.

This excellent little manual, which first appeared in 1906, has achieved its success because the author has the happy faculty of condensing a large amount of information in a small space and in choosing illustrations which really help in the elucidation of the text. Although it is a 12-mo volume of 611 pages, it contains an immense amount of valuable information. It should be popular with students because of its brevity and thoroughness, and with those practitioners who wish to keep in touch with morbid anatomy and pathology, because by turning to it they can with no waste of time get excellent opinions and clear views of the points which interest them. Many of the illustrations are taken from other authors, the writer recognizing that where a very typical picture can be obtained elsewhere it is unwise to try to reproduce an original which may not show so clearly the subject which is under discussion.

PRACTICAL PREVENTIVE MEDICINE. By Mark M. Boyd, M.D., D.P.H. Illustrated. W. B. Saunders Company, Philadelphia, 1920. Price \$4.

Dr. Boyd is Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas, and has been engaged for a number of years in the line of work which is covered by this contribution to medical literature. His aim, of course, is to present the salient features of modern preventive medicine, and although he admits that it has been necessary

to condense a large amount of information, thereby making his consideration of certain topics brief, he compensates for this by numerous references which he hopes will help those who wish to study the matter further find what they need. He does not claim that his text is in any way original, but insists that the medical profession must play an important rôle in the field of preventive medicine and public health if it does not wish this subject to be taken from it and placed in the hands of those less qualified to attend to it. In many respects the book may be said to be one upon what used to be called hygiene, since it deals not only with the matter of feeding, hazards of occupation, heating and ventilation, and similar subjects, but even takes up the statistics as to population, morbidity, and mortality.

The illustrations, which are not numerous, are taken in the majority of instances from other works. They are well selected to illustrate the points which the author wishes to emphasize.

A TEXT-BOOK OF PHARMACOLOGY AND MEDICAL TREATMENT FOR NURSES. By J. M. Fortescue-Brickdale, M.A., M.D., M.R.C.P. The Oxford University Press, New York, 1920. Price \$10.

Here we have a book designed for nurses, gotten out in the form of what might be characterized as an edition de luxe, with colored plates showing crude drugs and with numerous illustrations, no less than 77, covering a very wide field from black-and-white illustrations of plants to a diagram of the *x*-ray tube. In the space of 372 pages the author has included 32 chapters.

The book is much too scientific in our opinion for the nurse, and \$10 puts it out of reach of most nurses, and certainly out of the reach of the average training school.

The author is well known as one who has made valuable contributions to pharmacology, which contributions are useful to the practitioner and pharmacologist, but in this instance we believe that he has failed to recognize the limitations which surround a nurse's duty; thus, we can see no advantage in having a chapter upon Diseases of

the Blood and Ductless Glands in a nurses' manual of drugs, wherein he treats of such maladies as leukemia and diseases of the lymphatic glands, thyroid, parathyroid, suprarenals, and hypophysis. Nevertheless it goes without saying that as a reference book in the library of a nurses' training school it will prove interesting and useful.

BASAL METABOLIC RATE DETERMINATION. By Walter M. Boothby, M.D., and Irene Sandiford, Ph.D. W. B. Saunders Company, Philadelphia, 1920. Price \$5.

The authors of this book are attached to the section of Clinical Metabolism in the Mayo Clinic. It is not a large volume, there being only 117 pages including the index. There are a number of excellent illustrations of the apparatus which must be employed in the methods which the authors describe, and considerable space in the text is taken up by a useful bibliography. We note with interest that no less than 21 references are made to the work which has been done by Benedict, by himself or in association with others. No other author approaches this one in the richness of his contributions to this subject. The book at its close gives a large number of well-printed tables which are of assistance in working out the technical details described in the text.

THE SURGICAL CLINICS OF CHICAGO. October, 1920. Volume 4, No. 5. Illustrated. W. B. Saunders Company, Philadelphia and London.

This last contribution to clinical surgery contains, among other articles of value, one by E. Wyllys and Edmund Andrews and Mix on "Dumping Stomach" and Other Results of Gastrojejunostomy; one by Strauss on Various Methods of Blood Transfusion as Most Applicable in Various Ages; one by Albert Ochsner on Rupture of the Gall-bladder into the Duodenum; one by Eisendrath on Infections of the Kidney; one by Kanavel on Hematuria; and one by Moodie on Surgery and Disease Among the Pre-Columbian Indians of North America.

To the surgical practitioner these books, always of value, are often both an inspiration and a guide to better work.

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The Treatment of Acute Appendicitis

BY ALBERT J. OCHSNER, M.D.

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First, that patients suffering from acute appendicitis without regard to the severity of the infection or its character practically all recover, providing the appendix is removed with proper precautions by a skilled surgeon while the infectious material is still confined to the appendix.

Second, that in almost all cases this condition obtains for at least thirty-six hours after the beginning of the attack.

Third, that in severe acute cases the infection usually extends beyond the tissues of the appendix after forty-eight hours, and practically always if the patient comes under treatment later than seventy-two hours after the beginning of the attack.

Fourth, that the dissemination of the infection originating in a perforated or gangrenous appendix is greatly facilitated by the administration by mouth of food and cathartics.

Fifth, that almost all fatal cases following operation for the relief of acute appendicitis occur in patients who have been ill longer than two days and less than ten days before being operated.

Sixth, that all fatal cases which died without having been operated had received either food or cathartics or both by mouth after the beginning of the attack of appendicitis.

Almost all patients who died following operations had received cathartics or food

by mouth after the beginning of their attack.

As a result of these observations I formulated a plan of treatment in 1892 which I have applied constantly since then to the present time. For a period of the first eight years I demonstrated this plan of treatment to surgeons who visited my clinic, treating all cases of acute appendicitis consistently in this way and admitting every case that applied for treatment without regard to the condition of the patient or the length of time that the attack had lasted. A number of my friends introduced the same plan in their clinics, and after having tested its merits and compared the mortality with other forms of treatment, I reported the method before the International Congress in Paris in 1900 and again before the Surgical Section of the American Medical Association in 1901; and many times since the latter date, insisting upon immediate operation in acute appendicitis, usually within forty-eight hours, while the infection is confined to the appendix, and carrying cases with spreading peritonitis by the so-called starvation method with rectal feeding and gastric lavage, described later, to a point at which they can be operated with equal safety.

The method was so radically different from that generally in vogue at that time

that it gave rise to very vigorous opposition, but one by one the surgeons with the greatest amount of experience have accepted the principles laid down at that time, so that at the present time I believe the plan has received practically universal acceptance, except among some of the younger men who are not familiar with the history of appendicitis.

In the meantime it has been but natural that surgeons here and there have not taken the trouble to read any of the original papers, and have misconstrued and claimed that the method opposes all operative treatment of acute appendicitis, while as a matter of fact from the first I have insisted upon an early diagnosis and an immediate operation in all cases in which the patient comes under treatment early enough to make it fairly certain that the infection is still confined to the appendix, and have objected only to operations in cases in which the infection had already gone beyond the appendix at the time the patient came under treatment.

The method provides a safe form of treatment also for this class of cases, so that it results in an enormous reduction of mortality in all forms of acute appendicitis.

The plan of treatment and its philosophy can be expressed most clearly in the following concise conclusions:

1. The mortality in appendicitis results from extension of infection from the appendix to the surrounding peritoneum, or from metastatic infection from the same source.

2. The extension may be prevented by removing the appendix while the infectious material is still confined to that organ.

3. The distribution or extension of the infection is accomplished by the peristaltic action of the small intestines.

4. It is also accomplished by operation after the infectious material has extended beyond the appendix and before it has been circumscribed.

5. Peristalsis of the small intestine can be inhibited by prohibiting the use of every form of nourishment and cathartic by

mouth and by employing gastric lavage in order to remove any food substances or mucus from the stomach.

6. The patient can be safely nourished during the necessary period of time by means of nutrient enemata. Large enemata should never be given, for they may cause the rupture of an abscess into the peritoneal cavity.

7. In case neither food nor cathartics are given from the beginning of the attack of acute appendicitis, and gastric lavage is employed, the mortality is reduced to an extremely low percentage.

8. In cases which have received some form of food and cathartics during the early portion of the attack, and are consequently suffering from a beginning diffuse peritonitis when they come under treatment, the mortality will be less than two per cent if the peristalsis is inhibited by gastric lavage and the absolute prohibition of all forms of nourishment and cathartics by mouth.

9. In this manner very dangerous cases of acute appendicitis may be changed into relatively harmless ones of chronic appendicitis.

10. In our personal experience no case of acute appendicitis has died in which absolutely no food of any kind and no cathartic were given by mouth from the beginning of the attack.

11. The mortality following operations for chronic appendicitis is exceedingly low.

12. Were peristalsis inhibited in every case of acute appendicitis by the methods described above, absolute prohibition of food and cathartics by mouth and the use of gastric lavage, appendectomy during any period of the attack could be accomplished with much greater ease to the operator and correspondingly greater safety to the patient.

TO REDUCE THE MORTALITY FROM APPENDICITIS.

The following suggestions for the treatment of appendicitis are made with a view of reducing the mortality:

1. Patients suffering from chronic re-

current appendicitis should be operated during the interval.

2. Patients suffering from acute appendicitis should be operated on as soon as the diagnosis is made, provided they come under treatment while the infectious material is still confined to the appendix, if a competent surgeon is available.

3. Aside from insuring a low mortality this will prevent all serious complications.

4. In all cases of acute appendicitis, and in all cases of peritonitis, without regard to the treatment contemplated, the administration of food and cathartics by mouth should be absolutely prohibited and large enemata should never be given.

5. In case of nausea or vomiting, or gaseous distention of the abdomen, gastric lavage should be employed.

6. In cases coming under treatment after the infection has extended beyond the tissues of the appendix, especially in the presence of beginning diffuse peritonitis, conclusions four (4) and five (5) should always be employed until the patient's condition makes operative interference safe.

7. In case no operation is performed neither nourishment nor cathartics should be given by mouth until the patient has been free from pain and otherwise normal for at least four days.

8. During the beginning of this treatment not even water should be given by mouth, the thirst being quenched by rinsing the mouth with cold water and by the use of small enemata and by chewing wax or paraffin. Later small sips of very hot water frequently repeated may be allowed, and still later sips of cold water. There is danger in giving water too freely, and there is great danger in the use of large enemata.

9. All of these cases are greatly benefited by the use of continuous normal salt solution by rectum given by the very slow drop method according to Murphy's directions.

10. All practitioners of medicine and surgery, as well as the general public,

should be impressed with the importance of prohibiting the use of cathartics and food by mouth, as well as the use of large enemata, in cases suffering from acute appendicitis or peritonitis.

11. It should be constantly borne in mind that even the slightest amount of liquid food of any kind by mouth may give rise to dangerous peristalsis and may change a harmless circumscribed into a dangerous diffuse peritonitis.

12. The most convenient form of rectal feeding consists in the use of one ounce of any of the various concentrated liquid predigested foods in the market, dissolved in three ounces of warm normal salt solution, introduced slowly through a soft catheter, inserted into the rectum a distance of two or three inches.

13. This form of treatment cannot supplant the operative treatment of acute appendicitis, but it can and should be used to reduce the mortality by changing the class of cases with spreading peritonitis, in which the mortality is very high, into chronic appendicitis, in which it is very low after operation.

14. It is important to bear in mind the fact that this treatment is always indicated in every case of acute appendicitis without regard to whether an immediate operation is or is not contemplated.

15. It is further important not to be deceived by the very rapid improvement of what appear to be serious cases after introducing this treatment into the belief that the case is not a gangrenous or perforative appendicitis, because such patients may easily be killed by giving food too early.

For a number of years we have placed all of these patients in the Fowler position, and have applied large hot fomentations of saturated solution of boric acid, held in place by an abdominal binder.

Over this dressing we have placed an electric light in the form of a so-called therapeutic lamp. These methods seem to add to the comfort of the patient.

The Use of Suction in Otolaryngology— Technique of Application¹

BY ARTHUR J. WAGERS, M.D.

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Among the various agencies employed in the local treatment of suppurative inflammation involving the ear and the nasal accessory sinuses, suction occupies a high position in the scale of usefulness. Properly applied, it provides a most efficient means of obtaining physical cleanliness of the part being treated, and incidentally it produces a local hyperemia which, according to Bier, is of benefit in promoting healthy reaction in tissue exposed to the action of bacterial irritants.

Before taking up the details of application of suction, I wish to direct attention for a moment to the mechanism employed for the production of negative pressure.

There are in general use three types of apparatus—the suction pump operated by electricity, the Brawley suction apparatus for attachment to a water faucet, and the simplest form which consists merely of a rubber bulb which, after being compressed, produces suction by expansion.

Wherever current is available, the electrically operated pump will be found efficient for all purposes, the one objection to certain pumps on the market being that they are not provided with a ready means of regulating the pressure produced. The Brawley water suction pump has the advantage of being simple in construction, is light in weight, can be used wherever there is running water, and the pressure produced can be very easily regulated by controlling the amount of water passing through the instrument. The rubber bulb of course is ready for use at any time or place, but its use is limited by reason of the light pressure which expansion of the bulb produces.

Regardless of the type of negative pres-

sure pump employed, the complete apparatus consists essentially of a rubber tube connecting the pump with any one of a variety of applicator nozzles which it may be desirable to use. A bottle reservoir should be interposed at some point between the nozzle and the pump. This serves the double purpose of showing the total amount and character of fluid removed and prevents this fluid from entering the pump.

The applicator nozzle, from the practical point of view, is the most important part of the mechanism. Nozzles are made of metal, hard rubber, or glass. I find glass preferable because one is able to determine almost immediately after application whether fluid in any quantity is being withdrawn, and its general characteristics may be noted at the same time. Sharp edges on all forms of nozzle are to be avoided, and if the nozzle is intended to fit tightly into any natural opening, as for example the external auditory canal or the nostril, it is advisable to protect the tip by means of a band of rubber. These nozzles as well as the rubber connecting tube are easily sterilized, thus rendering the apparatus available for any type of operation.

In the application of suction it must be remembered that negative pressure may be so great as to cause the patient extreme suffering. It is good practice to begin with the lowest possible pulling force, and let it be gradually increased until the desired results are obtained. Applied in this way it is but seldom that a patient will complain of discomfort.

A vacuum pressure gauge may be attached to the apparatus, but personally I do not find this necessary.

I shall now consider in some detail the practical application of suction in the treatment of certain ear, nose, and throat conditions.

¹Read before the Philadelphia Laryngological Society, December 7, 1920.

Given a case of acute suppurative otitis media, we incise the membrana tympani to provide drainage from the middle ear. A certain amount of the contained fluid, being under pressure, flows into the external auditory canal; but complete removal of fluid can only be secured by applying suction. For this purpose a round, rubber-protected nozzle is inserted closely into the external auditory canal and the negative pressure allowed to act very gently. Even the lowest possible pressure may be painful if the operation is performed under local anesthesia or none at all. I recently heard a physician refer to this procedure in most uncomplimentary terms because he had seen a patient suffer severely from this method of treatment, and he therefore condemned it most heartily. To avoid this difficulty and for other obvious reasons it is better to operate under general anesthesia. But even then it must be remembered that too great pressure will frequently produce a hematoma in the wall of the external auditory canal. This is an undesirable occurrence, as by its presence it not only tends to obstruct natural drainage from the middle ear, but may itself become infected before absorption takes place. Daily removal, by suction, of the accumulated pus in the middle ear should constitute a part of the routine treatment of the condition.

Suction is quite as applicable in the treatment of chronic otitis media as in the acute condition and the technique is no different.

In the postoperative treatment of suppurating mastoids, suction may be employed to remove all pus from the wound. For this purpose it is advisable to use a nozzle of small caliber and long enough to reach all parts of the wound. I find that an ordinary curved tip medicine dropper answers the requirement exactly.

It is perhaps in connection with the diagnosis and treatment of nasal accessory sinus disease that suction finds its largest field of usefulness. At the same time the difficulties of application in this region are greater than those met with in treating

conditions involving the ear or throat. I mention suction as a diagnostic aid because we sometimes examine a case in which all the subjective symptoms indicate the presence of an acute sinusitis, but inspection does not reveal the presence of pus in the naris. If there actually be pus in one or more of the sinuses, suction, properly applied, will bring it out into the nasal passage where it may be seen, thus confirming at once what might for a time at least remain a doubtful diagnosis.

Two general forms of nozzle have been devised for use in the removal of fluid from the sinuses: the one intended for direct introduction into the natural outlet of the sinus to be treated, and the other form consisting of a nozzle which fits closely into the vestibule of the naris, and through this the negative pressure acts indirectly upon all the sinuses in a manner to be explained later.

The method of applying a nozzle tip directly to the individual sinus has not been found practical in the writer's experience, for the reason that the natural openings of all the sinuses, except that of the sphenoid and posterior ethmoids, are hidden beneath the middle turbinate and are not easily reached except after removal of at least a portion of this body, and unless this operation is indicated for other reasons it would seem a needless sacrifice of tissue.

The indirect method of applying suction to the sinuses is practicable and efficient, but for its successful accomplishment we must take into consideration certain points in the anatomical construction of the parts operated upon as well as the physical laws involved.

In a recent discussion of this subject, the point was brought out that a fluid lying in a cavity will not be made to flow upward and out of an opening situated above the fluid level when a vacuum has been produced in that cavity. The speaker failed to understand, therefore, how suction could be used to empty certain of the sinuses. When we consider that with the exception of the frontal sinus, the natural outlet of practically all of the sinuses is situated at a

point above the low level of the sinus, we realize that the position taken was correct.

It is self-evident that a fluid flows more readily from an opening in the bottom of its container than from an opening in the side, and particularly if that opening happens to be above the fluid level, as can well occur in the case of the maxillary sinus, for example. It becomes evident, therefore, that to so incline the head as to bring the outlet of the sinus being treated to the lowest point favors the removal of fluid when suction is applied. In addition to this we must provide for two other conditions which are essential to the success of the operation. The outlet from the sinus must be sufficiently patulous to permit of the passage of air and fluid. Direct application of a solution of cocaine or adrenalin to the area about the opening will insure this condition. It is further necessary that the soft palate be elevated to close contact with the postpharyngeal wall. After a few trials the patient is able to do this voluntarily, but it is often necessary to assist by some such simple act as swallowing, and when the position of the palate has been attained the patient is directed to hold it while suction is acting. At the same time the suction nozzle is fitted closely into the nostril of one side, while the nostril of the opposite side is tightly closed by the operator's finger. As the negative pressure is applied, this is what takes place: a certain amount of the air in the nares and in the sinuses is suddenly withdrawn; that is, a partial vacuum is formed. As the air leaves the sinus a portion of the contained fluid is carried along with it and both air and fluid move in the direction of the nozzle. But in a moment all movement of fluid ceases although the vacuum be continued. If now the operator releases the unoccupied nostril there is a sudden and forceful inrush of air backward, around the septum, and into the opposite nostril, and its sinuses and the vacuum cease to exist. We now have the same condition with which we began. To continue the suction, we simply close the free nostril again, and the process as

described is repeated until further operation fails to bring away fluid.

The procedure is the same for all the sinuses, bearing in mind the position of their respective outlets.

As the negative pressure often reaches the middle ear by way of the Eustachian tube, care must be exercised that the pressure be not so great as to injure that organ.

In the throat the use of suction is practically limited to its application to diseased tonsils and as a means of removing blood and secretions from the throat during nose or throat operations under general anesthesia.

When tonsils are distinctly diseased the rational indication is their removal. However, there are instances in which owing to the age of the patient, or because of conditions contraindicating the use of an anesthetic, it is not advisable to operate; and besides there are the patients who refuse operation. Such cases must be treated, and here again suction is of value as a means of cleaning out the pockets and crypts which have been opened at the surface.

The employment of suction for the removal of blood from the throat during operation has become so nearly universal in all our large hospitals, and the application is so simple, that there is little to be said except to emphasize its value. When efficiently employed it provides a clean field of operation, and, by preventing the aspiration of blood and germ-laden secretions from the throat, undoubtedly serves to prevent a certain number of so-called ether pneumonias and the development of lung abscesses which have been observed in certain instances following tonsillectomy.

I do not wish to convey the impression that suction alone is a cure for suppurating sinuses or middle ears, though one does see a certain number of these cases which clear up in four or five days with practically no other treatment than suction. Neither can it take the place of surgery when surgery is indicated. But it is a principle of surgery

that whenever and wherever pus exists in the body it should be removed. Suction thoroughly accomplishes this removal, and in so doing carries away a multitude of

bacteria and bacterial products from the area involved, and nature is thereby greatly assisted in restoring the tissue to its normal state.

A Comparison of Alcohol and Caffeine

BY H. L. HOLLINGWORTH, Ph.D.

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In the January, 1912, number of this journal the writer gave a brief report of a series of experiments on the influence of caffeine alkaloid on mental and motor efficiency in human beings. Recently opportunity was afforded to investigate, in the same careful way, the effects of alcohol in moderate amounts, such as may be consumed in the form of beer. In order to secure a more familiar basis of comparison, some of the same tests were used that were employed in the study of caffeine. This affords an interesting opportunity to compare the effects of the two substances on the same set of mental and motor processes, and the present paper gives a brief summary of such a comparison. Certain additional points bearing on the analysis of "idiosyncrasy" are also given, since these seem to have an important and far-reaching suggestiveness.

The subjects of the investigation were six adult males, who ranged in age from twenty-one to twenty-nine years, in weight from 106 to 182 pounds, in height from 64 to 75 inches, in previous alcohol habits from total abstainer to a regular user, and in initial morning pulse-rate from 66 to 92 beats per minute. They gave their whole time for a period of two weeks to the experiments, attempted at every trial to make the best possible record, gave thorough co-operation, and were in all respects an ideal experimental squad.

The doses used varied from 13 cubic centimeters to 118 cubic centimeters of alcohol. The alcohol was administered in the form of quantities of beer, containing 2.75 per cent of alcohol by weight. The

dose was taken practically on an empty stomach at the usual lunch hour. Six tests of each type of process preceded the dose in the forenoon, and six tests followed the dose in the afternoon. On certain days a "control" dose was given, which was identical in all respects with the standard beer except for the removal of its alcoholic content. On one day, instead of alcohol or control doses, a heavy midday meal was given.

From the caffeine study the following tests were chosen for use. All of these, it will be seen, involve processes and acts which are grossly affected in what is commonly known as alcoholic intoxication. The degree to which they were affected in the present case will be seen from the comparison of the results with those secured from the caffeine doses and from the heavy meal.

Steadiness.—A measure of tremor in the extended arm. Measure the number of movements of a stated magnitude in one minute.

Rate of Tapping.—The number of taps in one minute made by a stylus held in the hand, using forearm only. Measure number of taps per minute.

Cöordination.—Number of bull's-eye strokes with hand stylus at three small holes arranged to form the corners of an equilateral triangle. Measure number of hits in one minute.

Color Naming.—Naming correctly a series of one hundred color squares, made up of the random occurrence of five primary colors. Measure time in seconds.

Naming Opposites.—Giving the antonym of each of 50 words occurring in random

order, the order changed at each trial. Measure time in seconds.

Calculation. — Adding 17 mentally and correctly to each of a series of 50 two-place numbers. Time in seconds.

In addition to these tests from the caffeine study, certain other processes were included. A *learning test* showing the ability to master a number-form code, changed at each trial, was one of these. A *memory test* for pairs of words unrelated to each other was also used. Records were also taken of *pulse-rate* over a one-minute period, at each round of the tests.

In a more detailed publication in another connection the full results may be presented. For the present report perhaps the most direct procedure will be that of comparing the level of efficiency in the forenoon (before the dose) with the level of efficiency in the afternoon (after the dose). The results may thus be stated in terms of gain or loss, in per cent of the forenoon efficiency. By comparing blank days with control days the effect of the control dose may be determined. Comparison of the control effect with that of the alcohol-beer will then reveal the effect to be attributed solely to the alcohol content. The effect of the dinner may be secured by comparing the results on that day with the results on the blank days.

In the following table are given the true effects of each of the main doses, when the control effect appropriate to each condition has been subtracted. The tests used

crease in the score or rate. The figure in each case is percentage of forenoon efficiency, either gained or lost in the afternoon. In each case the records are "pure effects" —that is, the control results are the results of control doses in excess of the changes present on blank days. The alcohol and dinner records in the same way represent the effects in excess of the appropriate controls, and the caffeine results represent the effects of caffeine in excess of the effects of the control dose used in that investigation. Unless a minus sign is present the figure always means gain, except in the case of no effect, which is indicated by zero. The results show a degree of consistency from test to test and from individual to individual which the writer has never seen realized in previous drug experiments on human beings.

Comparison of the various sets of results is interesting, and shows in more concrete fashion than is ordinarily possible the difference between the various types of influence. The alcohol effects maintain the same direction and increase in magnitude with increase in dose. The alcohol effect on pulse-rate is considerably less than that produced by the dinner, and the control has no effect on pulse-rate.

The greatest effect of the alcohol in terms of per cent of the forenoon score is on "steadiness." All the agents, control, dinner, alcohol, and caffeine, produce unsteadiness. The unsteadiness following 40 to 50 Cc. of alcohol is quite like that follow-

TEST.	Blank Days.	Control Days.	Dinner Day.	Alcohol Doses		Caffeine Doses	
				40-50 Cc.	66-79 Cc.	3-4 gr.	6 gr.
Pulse-rate	-7	0	24	8	10
Steadiness	11	-21	-61	-68	-241	-2	-583
Tapping	-2	0	8	-7	-13	3	4
Coördination	3	-2	-2	-6	-10	0	-4
Color naming	-6	-3	8	-2	-7	7	4
Opposites	-2	-7	5	-5	-12	5	6
Adding	-4	0	5	-10	-15	2	3

in the caffeine study are here included, and the pulse-rate results are also given for alcohol and the dinner. It should be pointed out that the same subjects were not used in both alcohol and caffeine investigations. The caffeine data used here are from a squad of five subjects.

In the foregoing table a minus sign indicates a loss in efficiency, or at least a de-

creasing the dinner, and the effect of the larger alcohol doses is less than that produced by six grains of caffeine (the amount contained in about two ordinary cups of coffee).

In the case of coördination, color naming and opposites, the effects of control, dinner, both alcohol doses, and both amounts of caffeine are quite comparable

in amount, though often dissimilar in direction. The alcohol invariably produces lower scores, the caffeine higher scores, the dinner sometimes one, sometimes the other.

In adding and tapping the effects of the smaller and the larger alcohol doses are not unlike those of the dinner in amount, but are opposite in direction. These effects are also both larger in amount and different in direction, as compared with the effects of caffeine.

These results represent averages of the six subjects' records. All the individuals consistently give the same type of effect from alcohol, but they differ definitely among themselves in the degree of this effect. Two of the individuals are very susceptible, showing in all or nearly all tests effects from both small and large doses. Two individuals on the other hand show effects only after the larger doses. The remaining two individuals stand midway between these two pairs, showing less susceptibility than the first pair and more than the second pair. It is very easy to arrange the subjects in an order of susceptibility to the effects of alcohol. They show thus definite idiosyncrasy or individual differences in this respect. A detailed analysis of the factors involved in these individual differences has been made. Within the limits of the present paper it is impossible to give the figures on which the conclusions are based, since each point would require at least a page of figures, in addition to the description of the manner in which they were derived from the original individual records. It is hoped that in time it will be possible to make a complete publication, not only of the individual records in detail, but also of the basis of the following conclusions. For the present the study of idiosyncrasy yields a number of definite points of interest, which may be summed up here in the form of simple statements. It will of course be understood that these statements do not pretend to be generalizations capable of extension to all cases of idiosyncrasy to the effects of drugs. They apply to this group of subjects in their reactions to the alcohol doses. If it should later be shown that they indicate general

tendencies in the case of other drugs, the facts will have a very general value, both to medicine and to psychology.

1. Idiosyncrasy does not vary with age, initial pulse, or previous alcohol habits.

2. Susceptibility to alcohol effects varies inversely with height, weight, and habits of regular and active exercise.

3. Susceptibility varies inversely with general competence. Those who are able to do superior work in the tests in general are less susceptible than those whose final achievement in the tests is relatively inferior. The correlation between general competence and susceptibility is .77, by the method of rank differences.

4. Susceptibility varies inversely with capacity to improve as the result of practice. Good learners are less influenced than are poor learners. The correlation between susceptibility and ability to gain through practice is .94.

5. Susceptibility to effects of alcohol in performance in the tests is inversely related to the effects of alcohol on pulse-rate. Those who are most affected in their work show least change of pulse-rate. Those whose pulse-rate is most conspicuously changed by alcohol show least effect in their work.

The following table shows for each test the correlation with rank order for susceptibility to alcohol in general:

TEST.	Correlation between final proficiency and general susceptibility to the effects of alcohol.	Correlation between ability to improve through practice and susceptibility to alcohol in general.
Steadiness	-.09	-.49
Tapping	-.77	-.55
Coordination	-.09	.37
Substitution	-.77	-.60
Color naming	-.83	-1.00
Opposites	-.83	-.71
Adding	-.71	.43

As is well known, such tests as those here used are commonly employed as measures of general competence or intelligence. Further, there is reason to believe that final ability, after practice, as here employed, is a still better measure of general intelligence than are initial records. Moreover, ability to improve through experience—that is, learning ability—is also closely related to general intelligence.

In another connection (Psychology of

Functional Neuroses, D. Appleton, New York, 1920) the writer has shown that general intelligence is a very important factor in determining the manifestation of psychoneurotic symptoms. The caffeine data, not yet fully analyzed in this respect, also strongly suggest that it is the relatively incompetent who are most susceptible to the effects of the drug.

The mechanism which produces these results and their significance in the nervous and mental make-up of the individual may well constitute the incentive to speculation. But whatever explanation be accepted, the results, both for experiment and for prac-

tice, in connection with drug effects and neurotic complaints, have a far-reaching importance. If it should be ultimately shown that these results can be generalized, and that *idiosyncrasy* to drug effects, that vague term which covers a great lack of knowledge in pharmacology and psychology, is in part at least a function of general intelligence, this will be worth knowing. Taken in connection with the demonstrated relation between general competence and the functional neuroses, such results will go far toward realizing Kraepelin's early hopes of the future of pharmacopsychology.

The Ebb and Flow in the Tide of Harmful Indulgence

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Man has a wonderful recuperative power, biologically, intellectually, and even spiritually; he is remarkably adaptive to environment, and harmful indulgence leaves less mark upon the race than moralists would have us believe. Mass indulgence is all but fatal, whole civilizations having gone down under the corrosion of lewdness, with its attendant pathology; and certain races lack in stature and attainment through the moral decay induced by evil indulgence. Yet it must be admitted that the physical effects of harmful agents over-indulged are more quickly recovered from than are the ethical and spiritual decay induced by them. "The survival of the fittest" is more a physical truism than a moral or mental one, for the physically weak die off by virtue of natural law, while the mental and moral degenerate may long survive and propagate his kind to the up-building of a race or nation of low ideals and wretched habits.

Harmful indulgence has its ebb and flow. Were this not true the race would long since have seen its declension into a permanent dark-ages status. Even war, with all its horrors, never serves for long to blot

out the better side of human propensity. The pendulum of civilization swings from one extreme to the other, and the wheels continue to go 'round and 'round despite the manifest evils of the left that serve to drive the pendulum back again to the right, with a certain longer normal between the extremes. Among savage and uncivilized races there is stagnation, neither extensive harmful indulgence nor uplift periods of physical and moral regeneration. The real benefits, therefore, are more with the civilized peoples than with the savages, and this despite the accentuation of harmful indulgence among the former. So, then, we should not overstress harmful indulgence; it is productive of its own antidotes from the physical side, and the real function of the moralist is not to blot out all indulgence and all sin, but to neutralize their effects by building up a moral and religious power of resistance, thus raising the ethical opsonic index, as it were, of the people. The Garden of Eden experiment failed; but if it had not failed we have no guarantee that man would have been more than a mere neutral influence in the world. Having no sin or harmful influences to

fight, he would have become soft and mediocre. It is futile to urge absolute elimination of all that is harmful in this world.

There is a certain normal incidence of harmful indulgence that may not be suppressed. Overeating, late hours, foolish types of dressing, and many other excesses are harmful; but indulgence brings its own punishment. It is futile to endeavor to limit man to the strictly necessary, and such relatively innocuous indulgences as drinking coffee and smoking tobacco must be condoned if not excused, and this despite the fact that coffee and tobacco are often harmful. Yet many persons are not willing to stop there. Certainly it is not wise to encourage the excessive use of caffeine taken as an indulgence, bringing more prompt response than will the drinking of coffee which contains caffeine; and who would think of isolating the active principles of tobacco and encouraging people to indulge in them in the place of smoking?

The more harmful ways of using tobacco, its adulteration with harmful agents, its sale to adolescents, etc., are proper things to regulate; but to become fanatical over these minor indulgences is neither wise nor conservative of good manners and morals.

After all, two factors tend to produce extremes in indulgence, and they are: commercializing the harmful indulgences and prostituting science to increase their hazards. The sex urge is normal and productive of an excess of good over the evil that may, under normal conditions, be associated with it. A certain minimum of sex vice is inevitable, but that minimum does not warrant vows of celibacy or undue interference with the rights of the individual to propagate the species. It is right, on the other hand, to deny sex indulgence to the person with syphilis or gonorrhea and to establish the civil and religious institution of marriage and the family. But vice, which must be expected in some degree, when commercialized becomes wholly an evil, and commercialized vice should be suppressed by wise and constructive measures.

Indulgence in alcohol may always be

more or less harmful, but so long as the natural fermentation of fruit juices productive of mildly alcoholic drinks was the only resource for indulgence of the taste for alcohol relatively little harm resulted; but man was not satisfied with what nature produced for him and he commercialized the wine business, fortifying the wines with additional alcohol, distilling the spirit from them and producing brandy, blending wines, adulterating them, etc., and creating of natural wine so-called improvements that were unnatural and harmful. To this science contributed, producing a host of concentrated alcoholic liquors, which the commercialist exploited, finally building up a business that became a menace to society.

Naturally, society protected itself by more or less drastic legislation or prohibition. From the standpoint of society at large absolute prohibition was justified, probably not from the biologic or ethical point of view, but because of the evil commercial exploitation that it seemed could not be controlled by regulation and that society determined must be destroyed. Realizing that there are certain medicinal and other proper uses for alcohol, certain exemptions and exceptions were incorporated in the laws designed to enforce prohibition in the United States.

The first difficulty to be confronted was the fact that biologically and ethically prohibition was a device that "dropped a monkey-wrench into the machinery." This, in my view, is not a very serious matter, since it is self-adjusting, and after certain adjustment the prohibition machine may be made to work smoothly—that is, if the "fanatics" are controlled and the work of enforcement is properly oriented. It is not the absolute suppression of alcohol that society is demanding in this country, but the destruction of the discredited commercial liquor business and the prostituting of science in the production of unnecessarily strong and improperly used alcoholic liquors.

But the "fanatics" are not going to be controlled until after the complete suppression of the evil commercial system that

profited by making drunkards of our people. We may as well face this issue.

Incidentally, in the work of this bureau, we become rather intimately informed about the status of alcoholic abuses under the degree of prohibition now existent in this country. Without in the least being warped by personal view, and going purely by the law and the evidence, we are in position to express some views regarding the question, more especially as relates to Pennsylvania.

Perhaps it may be said that we are suffering from an overdose of antidote administered without first eliminating the poison for which the antidote was given, the result being that the patient is suffering from both the poison and the antidote, the poison being camouflaged and the antidote unnecessarily nauseating.

Knowing that there is no scientific justification for man to imbibe the concentrated alcoholic liquors produced by distillation or reënforcement, and that if such products are used medicinally they should be diluted, the writer has long held to the view that the manufacture and distribution of such intoxicants should cease; but he also was inclined to make the concession to others who advocate light wines and malt liquors (which he does not personally advocate or use) that their manufacture and distribution might continue, at least for a period of years, without serious menace—that is, if they were honestly made under rigid pure-food regulations and vended unobjectionably.

The difficulty in such reasoning was the fact that the commercial factor was not duly considered. Our experience in this bureau has forced the conclusion that the "fanatics" before referred to knew the commercial liquor business better than we did, and had formed a more exact estimate of how it would deport itself under prohibition than we had formed.

This bureau knows that Jamaica ginger and other medicinal preparations of high alcoholic content are now being sold in grocery and other merchandising stores, bootlegged, etc., to a degree that exceeds hundreds of times over the legitimate sales

of such products in drug stores, and they are being used principally for purposes of intoxication and the trade catered to by certain erstwhile liquor dealers.

It may astonish physicians to hear that we have ascertained the fact that Hoffman's anodyne and Hoffman's drops are being used as intoxicants to probably a thousand times the degree that they are used medicinally, principally among miners of foreign birth. These miners, especially the Polanders, drink ether regularly as an indulgence, and we have found drug stores buying ether in lots of one hundred to two hundred pounds, and alcohol by the barrel, to make up Hoffman's drops (approximately one-third ether and two-thirds alcohol) to sell to miners. This trade was largely suppressed by this bureau, when it was at once taken up by the grocery trade. Recently, in the Panther Valley, a mining district, we found at least a carload of Hoffman's drops put up in one-and-one-half-ounce bottles for sale in the wholesale and retail grocery establishments of the valley. This is used by adding to coffee, and is consumed to the point of intoxication, frequently a whole bottle at one dose. Miners other than the Polanders evaporate off the ether content and drink the remaining alcohol. Many accidents in the mines are directly due to this form of indulgence, the mining companies are much concerned over the matter, and this bureau is endeavoring to stamp out this trade. Such is one of the fruits of exemptions "for medicinal use" in the Volstead Act.

Another "medicinal" exemption has resulted in the market being flooded with so-called "wine" tonics, some of them duly medicated, but large numbers of brands being nothing but cheap California wine reënforced with alcohol, and perhaps a trace of gentian or taraxacum. These are nothing but "booze" pure and simple, and these products are being sold in the aggregate literally by the trainload, resulting in much intoxication.

The writer has counted as high as twenty-nine different kinds of "medicine"

displayed and on sale, along with near-beer, in the saloons or bars of Pennsylvania. All sorts of "vinos," "vins," "cordials," "tonics," "bitters," "bitter wines," "ginger extracts," and other "medicines" are offered for sale in these places, and the great bulk of them are consumed for purposes of intoxication. They are all alike in one regard; their alcohol content is high.

Some deaths and numerous cases of illness have come to our attention, due to the popular use of such "medicines" as beverages, the illness being induced by the exceptionally low grade of wine or liquor in these products, and not from any active drugs contained. We could point out communities where intoxication is now more general than before the Volstead Act became effective, a great part being induced by these camouflaged "medicines."

This flow in the tide of harmful indulgence is to be laid wholly to the door of the commercialist. Doubtless, in time, such abuses will be eliminated, but not adequately before "medicinal usage" is more clearly defined in the law, or the Volstead Act so amended as to crush out the commercialism that only wants an inch to take a mile, and that will, on the slightest opportunity, negate all law and all decency purely to make money by catering to human weakness.

Such conditions, as well as others to be referred to under the consideration of harmful indulgence in narcotics, have very definitely impressed us with the view that the main thing to accomplish by law is the complete suppression of the liquor business, as such, removing from it all legal and political support, taking away from it all profit, and rooting out from the proprietary medicine business all domination or control by the liquor trade under a mask. Extreme agitation by "fanatics" will not cease, and should not cease, until after these ends are accomplished. Propagandists go to extremes, it is true, but so do commercialists.

True, half-hearted enforcement of the Volstead Act, as well as official winking at abuses, are responsible for liberating from bond alcoholic liquors in excess of the pro-

visions of the law; and it is also true that adequate and impartial enforcement will alleviate the situation in time. It must be admitted that, thus far, especially in large cities and in sections populated by foreign laborers, prohibition has been a very dubious success, if, indeed, it can be called a success at all. Better far to have honest wine and beer than dishonest "medicines" that are only low-grade booze!

Yet, what the newspapers do not report, there are large sections wherein prohibition is relatively well enforced. These communities are not played up in the press; but this bureau knows of them, and it must be fairly acknowledged that prohibition is certainly a blessing in these places. None of the direful results of prohibition prognosticated by its opponents are in evidence in these favored communities.

The writer never has regarded alcohol as of importance from the medicinal point of view, and he has rarely prescribed it except for the aged and for patients seriously ill who have been accustomed to regular use of intoxicants and whose recovery might be jeopardized by shutting off an indulgence to which the patient has been habituated. Yet he recognizes the fact that more able physicians often disagree with him, and he is broad-minded enough to concede to the individual physician the right to determine for himself what attitude he should take in this matter. Certainly, as an official concerned with the problem of harmful indulgence, it is not within his province to endeavor to impress personal view that may be regarded as extreme by many able clinicians. Yet we should have some rational standardized basis for therapeutic usage of alcohol that would meet with general professional and legal support in place of mere bureaucratic rulings concerning just how much liquor may be prescribed for a sick man and just how long that supply should last. The medical profession may be trusted to regulate this matter, with perhaps some abuse here and there; but the medicinal usage of alcohol should be entrusted *wholly* to the medical profession, not to the proprietary medicine interests or

the liquor trade masquerading as makers of medicine. It seems to me that the whole profession can agree on this matter, thus eliminating mere commercialism from the medicinal usage of alcohol. It may be stated that the legitimate proprietary medicine interests would not be injured in the least by such requirements.

At present harmful indulgence in alcohol is at ebb tide, but with too much back-wash that brings up the dirty side of such indulgence. Just how long this ebb tide will last no one can foretell; it is dependent on too many factors. We are trying a great experiment and the trial should be an honest one, the law be duly enforced, and very careful scientific observations made. It must be admitted that people can get along very well without alcoholic liquors, just as they could get along without tobacco and coffee; but exactly how far prohibition in any of these agents should be carried, as the *final* policy, can be determined only by trial. The matter is not an academic issue, and it must be admitted that any reform can defeat itself by the enforcement of narrow policies.

It seems to the writer that science should rule in the final determination; not a commercialized science, or any type of paid-for science, or even propaganda determination, but the patient, scientific study that has served to solve many problems in the past—an unbiased and long-continued study of the problem in all of its bearings, with controls, and in which the laboratory worker, the clinician and the sociologist should join forces.

Harmful indulgence in narcotics of potent nature, such as opium, morphine, heroin, and cocaine, and potentially harmful somnifacients, such as hydrated chloral, hyoscine, and some of the synthetic products, is in a different category from the more social indulgence in coffee, tobacco, and mild alcoholic beverages. Other than in proper medicinal usage, these agents are wholly bad—admittedly bad.

Figuring all of the opium alkaloids to an opium basis, the hospital usage of them in Pennsylvania shows a yearly per capita of

about three grains. That is, a hospital treating three thousand patients in a year uses about nine thousand grains of opium, or alkaloids of opium representative of that amount of the crude drug. On the other hand, the yearly per capita usage of opium in Pennsylvania, counting every man, woman, and child in the State, is twenty-four grains, which is eight times the hospital per capita, and largely due to unwise exceptions and exemptions in the laws. This, of course, predicates abuse—an abuse that may not be condoned and that should be rigidly suppressed. On this proposition I am sure the medical profession, as well as all honest citizens, are agreed.

But if we are to blot out the more harmful indulgences from society, which it is admitted we should do, is it wise to endeavor to sweep out of existence every minor form of abuse that may become harmful if carried to the extreme? The moralist says yes. Is he correct in this view? Again, is it wise *suddenly* to legislate a long-indulged habit out of *legal* existence, whatever may be said of its *actual* status? These questions are more or less academic, and, as has been pointed out, prostituting science and overexalting commercialism has been responsible for popular efforts at sudden suppression of certain things.

It seems to the present writer that the medical profession may well take ground against the prostitution of science. Chemistry was responsible for many of the horrors of the late war. Have we any evidence that the chemist effectively raised his voice in protest over the use of poison gas and unduly vicious explosives? Since prohibition has come in, certain psychopathic inebriates have rushed to synthetic analgesics and hypnotics for relief, and many have been killed by taking overdoses. Aside from warning issued by the New York City Department of Health, what protest has been made against this dangerous practice?

It is not a tenable position for the medical profession at large to push off on the departments of health the whole propa-

ganda against such abuses, be they alcohol abuses, narcotic abuses, or the abuse of other drugs. Propaganda is the necessary result of the lack of action. If action is taken at the first sign of danger, propaganda becomes a very minor need. Simply allowing an abuse to proceed to dangerous lengths, until the discriminating public is aroused to the danger, makes propaganda necessary; and propaganda may go to too great lengths, forcing the doing of many things unwisely in order to meet a situation that should not have arisen.

To show what propaganda does, and how a victory is won by propagandists, even though the victory be of far-reaching benefit, since prohibition has been enacted into law certain enthusiasts are continually endeavoring to impress upon this bureau that it is its duty to begin a crusade against the cigarette and other forms of tobacco, against soda water, and even against chewing gum. We are asked to suppress vaccination, the use of "rotten horse juice," as serums are called; to be against calomel, acetanilide, aspirin, all forms of cosmetics, and everything under the shining stars that some fanatic thinks ought to be crushed out of existence simply because he does not believe in them. Sweet reasonableness is no part of the creed of the fanatic.

There is an ebb and flow in the tide of harmful indulgence; and taken at the flow it leads, not to fortune, but to a great propaganda that produces some good things and, as well, some harmful ones. The scientific method is to induce an ebb in the tide of harmful indulgence, and then, having reached low tide, to crush it before it gains momentum for a return to high tide.

This is the policy we should pursue as regards all *new* menaces. For instance, ether drinking is a new menace in this country imported from Eastern Europe. We should crush it before it becomes much of a problem. Smoking cannabis leaves is a South American vice that makes the smoker go insane within a year or two. It is being introduced into this country, and we should ruthlessly crush it before the habit spreads here. Taking veronal as a

substitute for alcohol is just beginning to show itself as a vice. Veronal is a useful drug but a dangerous indulgence, and we should crush out its improper use as promptly as possible.

And as to the *old* harmful indulgences, we should try to induce a low tide, and then keep it there. If the indulgence is wholly harmful, then, having induced a low tide, it may be well to crush it out of existence. But this thing of attacking a high tide with a broom is poor policy, for that is no time for a clean sweep. Perhaps the building of a legislative dyke or sea-wall is the correct method; but dykes leak and sea-walls require constant repairs. They are good so far as they go, but the scientific method is to gain ground by attacking the menace of the sea at low tide and in fair weather.

Note.—Since the above was written the alcohol permits of many hundreds of manufacturers of so-called "medicine" have lapsed, and the authorities in charge have refused to renew them. This official attitude should be given earnest support by the medical profession, since there promises to be a vicious legal fight against the Washington rulings.

Intracistern Injections of Salvarsanized Serum in Neurosyphilis.

MCCUSKER, in the *Boston Medical and Surgical Journal* of October 21, 1920, states that since the beginning of the use of salvarsan therapy they have at the Butler Hospital of Providence, R. I., made a special effort to overcome the previous unfavorable results in neurosyphilitic treatment. Intravenous, intraspinal, and intraventricular methods have been used. At first intravenous therapy alone was the rule. Later on the method of Swift-Ellis was adopted. In 1916 a publication was issued from the hospital on this latter method of treatment in general paresis and great results were predicted. A separate publication will show the unfavorable end-results in these cases.

They have also tried intensive intravenous therapy with routine lumbar drain-

age of the spinal fluid. On several occasions intraventricular therapy has been used.

Every one of these methods offered hope at first, but their statistics show that they were disappointing in their results. The introduction into the ventricles of salvanized serum was the most promising, but this necessitated trephining and was not resorted to in early cases on account of the disfiguring trephine scars. It still has merit.

The excellent work of Ayer and others in showing the ease with which the cisterna magna can be drained in meningitis and other diseases opens up a new avenue of approach in the treatment of neurosyphilis. He has attempted, therefore, cistern puncture with the replacement of the fluid by diarsenolized serum.

He presents the following case, by way of preliminary report, to show the application of the method and with the hope that it may stimulate like work by others. The case selected is that of a patient who has a definite history of syphilis of long duration and who, in addition to the routine treatment following the primary lesion, had intraspinal therapy several years later for the relief of tabetic pains. For the past several years he has had treatment at one of the favorite springs. At the present time his blood Wassermann is negative and the spinal fluid Wassermann is four plus. In addition to these serological findings he also has somatic signs of neurosyphilis.

On account of the patient's activity, light chloroform anesthesia was used. The patient was placed on his side and his head flexed on his chest, with the occipital protuberance on the same horizontal plane as the spinal column. An ordinary lumbar-puncture needle of 18-gauge and graduated in centimeters was used. The technique used in the puncture is the same as that in use by Ayer at the Massachusetts General Hospital.

By palpation with the thumb a depression may be felt below the occipital protuberance in the median line. By pressure the spine of the axis may be palpated, and

just above it "a definite soft spot may be felt," which is the area between the lower margin of the base of the skull and the spine. With the thumb of the left hand pressing firmly into this depression, the needle in the right hand is introduced into the skin in the median line of the back of neck and in the space between the base of the skull and the axis. The direction of the needle is slightly upward and in the line of a plane passing through the glabella and the upper edge of the external auditory meatus. As the needle is pushed forward the resistance of the dura and of the posterior occipitoatlantoid ligament, which extends between the posterior margin of the foramen magnum and the posterior arch of the atlas, is felt plainly and is to be overcome. With the needle inserted at a distance of 5 cm. fluid is obtained. After estimating the pressure (140 mm. in this case), 15 Cc. of fluid was withdrawn and 15 Cc. of diarsenolized serum was introduced slowly by the gravity method. The patient recovered from the anesthesia while on the table and has suffered no ill after-effects.

Cadaveric and living experiments have shown that a needle inserted to a depth of 4 to 5 cm. would enter the cistern and allow over 1 cm. clearance of the medulla.

To some men occipito-atlantoid puncture may appear as a radical procedure, but in the light of the experimental work of Ayer, Wegeforth, and Essick, at the Army Neurosurgical Laboratory, and of the practical work of Ayer at the Massachusetts General Hospital, it appears as a procedure with a percentage of danger no greater than that in lumbar puncture.

McCusker summarizes his paper as follows:

1. Cistern puncture offers another route of application in the method of therapy in syphilis of the central nervous system.
2. It gets the serum nearer to the seat of the disease.
3. It is easier to accomplish than a spinal tap.
4. It offers no more danger than rhachicentesis.

Editorial

GLUCOSE IN THE TREATMENT OF PNEUMONIA.

When physicians recognized, many years ago, that different cases of pneumonia varied to an extraordinary degree as to severity, they did not know that this difference was largely dependent upon the fact that in one instance Type I or II or III of the pneumococcus was the cause of the illness, whereas in the mild cases Type IV was the chief factor. They did, however, recognize that the severity of the illness was often dependent upon the condition of the patient at the time that he was stricken, and they knew that where there was an underlying diabetes or nephritis the prognosis in any case was far more grave than when pneumonia attacked a seemingly healthy man.

It was hoped when the first three types of pneumococcus were first differentiated that this would be the pathway by which an antipneumococcic serum might be prepared which would be as efficient as is the antitoxin for diphtheria. Up to the present time it has not been possible to prepare a serum which offers any assistance in infections by Type II or III, although reports as to its use in pneumonia due to Type I have been encouraging. Nevertheless the speedy onset and development of the disease and the lack of a trained technician to determine the type of infection, combined with a delay in obtaining the serum even if Type I is recognized, prevents the use of this specific remedy in the vast majority of cases, and the reaction which develops in many patients after it is injected intravenously (for, as is well known, it must be given in this way) doubtless has made many physicians hesitate before employing it in another case.

The result of all these influences is that our treatment of pneumonia is still very largely symptomatic and promises to remain so for a long period. While no

specific form of treatment has been developed, nevertheless every additional measure which seems to promise value, particularly if it aids the vital forces of the patient in combating his infection, should be sufficiently tried to determine its value, and if experience indicates great usefulness it should be generally employed.

Many physicians do not recognize the amount of physical stress to which a patient is subjected when suffering from this disease, entirely apart from any toxemia which may arise from the infecting organism. The rapid respirations expend an amount of energy which is difficult to estimate. If any person in health sits by the bedside of a pneumonia patient with rapid respirations and attempts to voluntarily keep pace with his breathing by means of his own respirations, he will be surprised how soon he becomes fatigued, and while in true croupous pneumonia the pulse-rate is not increased as it is in most acute infections, nevertheless the labor of the heart is materially greater than in health. At the same time the patient, because of his fever and for other reasons, is unable to take his ordinary food, which, if he were carrying out voluntary exercise, he would soon demand, and so before many hours have elapsed his physical exhaustion diminishes his vital resistance to such an extent that he can offer but little resistance to the infecting germ.

The use of stimulants simply increases the expenditure of his energy as the whip increases the expenditure of energy in a tired horse, and therefore any measure which looks to the supplying of a foodstuff in such a form that it can be readily utilized demands attention. For a number of years those who are chiefly engaged in caring for sick children have been resorting more and more to the intravenous, or even intra-abdominal, injection of solutions of dextrose or glucose, particularly in cases when the condition of the alimentary canal is

such that feeding by normal methods is impossible.

In the *American Journal of the Medical Sciences* for October last, John reports upon his experience with the intravenous injection of glucose in the treatment of pneumonia in an army hospital. He states that he has employed it more than one thousand times without seeing a single instance where the effect seemed to be disadvantageous. He employed, as a routine measure, 250 Cc. of a 10-per-cent solution of glucose, adding to it a small quantity of morphine, atropine, and about 15 minims of the tincture of digitalis. The immediate results which follow such injections are in his experience a sense of increased comfort on the part of the patient, who often drops asleep and obtains immediate rest. There is also a fall in temperature varying from one to three degrees, a greater flow of urine through the kidneys, and a better secretion by the skin, accompanied by a slowing of the heart and an increase in the pulse volume.

John considers carefully various experiments which have been made by investigators as to the quantity of glucose which can be given intravenously within a given space of time without developing a glycosuria, and quotes Erlanger and Woodyatt, who found that as much as 10 to 12 grains of glucose per $2\frac{1}{2}$ pounds of body weight may be injected per hour before sugar appears in the urine. While their researches were in animals, John points out that this would be equivalent to about two pounds of sugar per day for a man of average weight. In John's testing of this method of treatment, he found that more than two injections per day were rarely necessary and sometimes only one. Care, of course, must be taken that distilled boiled water is used to make the solution. In some instances a chill follows the injection just as it follows any other venous injection, but this has never in his experience been followed by other disagreeable symptoms. He did not find that the injection produced hemolysis, and he believes that it adds very materially to the nutrition of the patient.

John's report is the more interesting because it is manifest that a very considerable number of his patients belonged to Type II, which ordinarily has a high mortality.

Experiments which have been made as to the value of sugar in its ability to increase the strength of the heart in soldiers on the Continent of Europe during the great war indicate that it is a very efficient supporter of this organ. Of course it is wise not only to use distilled sterilized water, but to sterilize the solution after the glucose is added. The injections are given, as is any intravenous injection, either by means of a gravity apparatus or a 10-Cc. syringe with a three-way stop-cock.

In concluding his paper, John states that Mosenthal has called his attention to the fact that ordinary commercial glucose is found to be preferable to the chemically pure product so-called, because in the purification of commercial glucose traces of acetic acid remain, and it is suggested that these traces are responsible for some of the chills that follow the injection, since in Mosenthal's experience commercial glucose failed to produce chills, while so-called "chemically pure" glucose did so.

The question arises as to whether in some instances where intravenous injections are deemed unwise, it will be proper to resort to the intra-abdominal injection method, which, it is to be remembered, consists in introducing a hollow needle just below the navel and injecting from 250 to 500 Cc. at body temperature. This has been done frequently in the treatment of children. In the October issue of the *American Journal of Physiology* there is a communication by Cunningham in which he details experiments made upon animals to determine what the effect of such injections is upon the mesothelium of the abdominal cavity, his general conclusion being that the effect is stimulant and not destructive.

When the digestion and assimilation of ordinary food by the stomach is difficult or impossible, this glucose method would seem to be indicated to maintain nutrition.

THE VALUE OF SQUILL AS A CARDIAC STIMULANT.

For a good many years it has been recognized by pharmacologists and physicians that squill was closely allied to digitalis in its influence upon the heart muscle. It has also been recognized that in an overdose it was somewhat irritating to the kidneys, and that partly by this kidney effect and partly by its cardiac effect it would sometimes act more advantageously in cases of cardiac dropsy than would digitalis.

For half a century physicians have been in the habit of prescribing in cardiac dropsy a pill containing a grain of digitalis leaves, a grain of powdered squill, and a grain of calomel; in other words clinical therapeutics indicated that the squill acted as an adjuvant to digitalis in this condition. There have been, however, no very thorough studies to determine the exact influence which squill could exercise upon the heart muscle—such studies as are made with the newer instruments of precision; and, therefore, an investigation carried out by White, Galboni, and Viko with the aid of the electrocardiograph deserves attention. Unfortunately the number of patients that were studied is not as large as is to be desired before reaching definite conclusions, but they seem to have proved that while squill emphasizes the effect of digitalis and acts in a manner closely allied to it, it is a much more feeble drug in its influence upon the heart muscle, and for this reason is probably of little value as a cardiac stimulant in the doses in which it is commonly employed. It is to be recalled, however, that the cases in which they employed this drug were severe, in the sense that a number of them had auricular fibrillation.

So far as the electrocardiographic records are concerned, they found that full doses depressed, flattened, or inverted the T wave, as does digitalis, and that heart block might be produced by large doses. It is also interesting to note that even when they employed doses far in excess of those commonly used, toxic symptoms were not

marked or occurred with great rarity. By large doses they mean from 2 to 4 drachms at a dose instead of 15 minims of the tincture, which is the dose most commonly employed when squill is used in a tincture form.

It is also interesting to note that they did not find that squill increased the urinary flow, except in two cases of edema, and this after the drug had so reduced the pulse-rate as to be noticeable in its effect. These two cases, however, were distinctly dropsical, and the supply of fluid in the tissues provided an adequate reservoir from which fluid could be obtained for diuresis, whereas in the other cases which had no edema, no such reserve of fluid could be called upon.

This electrocardiographic study, therefore, confirms the views held by most practitioners heretofore, namely, that squill produces a digitalis-like effect far less powerful than foxglove, and that it cannot be used as a substitute for foxglove unless the doses are so large as to be irritating to the kidneys if perchance they are already inflamed.

DECAPSULATION OF THE KIDNEYS.

Readers of the THERAPEUTIC GAZETTE will recall that not very long since we called attention to a series of cases reported by Morse upon the employment of decapsulation of the kidneys in nephritis occurring in children, and our readers will also remember that on a previous occasion we called attention to the work which was done by Edebohls and others along these lines, expressing the opinion that a resort to this operation in the majority of cases is unwise, although it is true that in a certain proportion it had seemed to do much good.

The difficulty has been to determine the type of case in which such an operation should be resorted to, and it would seem on general principles to be fairly clear that little can be expected of decapsulation in

chronic contracted kidneys and but little more in chronic parenchymatous nephritis, unless the disease has existed a comparatively short time and there is reason to believe that a sufficient amount of secreting epithelium is still left which, when relieved of pressure by decapsulation, may once again functionate. In this connection our readers will be interested in a communication made to the Section on Urology of the Royal Society of Medicine of London by Horder in October, 1920, the cases being also reported in the *British Medical Journal* of November 13, 1920. As Horder points out, many of the earlier cases that were operated on, though called cases of Bright's disease, were evidently not so, and he adds the sapient words "the data have not yielded definite indications for the operation."

At first simple puncture was resorted to, then kidneys were incised, then they were decapsulated, and later on surgeons became more bold and have decapsulated both kidneys at the same operation.

In Horder's report there are four cases. The first two are quite remarkable and were highly successful in their end results, whereas the second pair were only partly successful. In the first instance, a woman of thirty came under observation in 1914, with a history of swelling of the legs and thighs, which began four months previously and gradually increased. She had dyspnea on effort and some vomiting. There was nothing in her previous history to throw any light upon the origin of her illness, but she presented the picture of so-called parenchymatous nephritis, passing about 30 ounces of urine in the twenty-four hours, with a specific gravity of 1.015, a considerable amount of albumin with granular and epithelial casts, and a blood-pressure of 120 mm. There was no thickening of the radial arteries and the heart was normal. Under ordinary medicinal treatment the patient was discharged relieved about six weeks after she was first seen. Nine

months later she reported that she had been fairly well until six weeks previously, when she noticed a return of the swelling. She was found to be more anemic and more edematous than on the previous examination. There was some ascites, the urine amounted to only 20 ounces, with specific gravity of 1.020, and casts were abundant. As she did not improve under six weeks of ordinary treatment, both kidneys were decapsulated. The capsules were more adherent to the kidney substance than is normal, both kidneys were a little large, slightly mottled, but certainly not pale. The patient made an uninterrupted recovery from the operation, an improvement in the secretion of urine and in the edema and albuminuria beginning at once, so that after the second week there was no edema, the urine secretion was normal and only a trace of albumin was present. Six weeks after the operation the patient was discharged quite free from edema, with no albumin and no casts. Five years later the patient consulted Horder to get advice as to whether she could get married and go to live in India. At this time he found no signs of disease and she seemed to be in most excellent health. There was no albumin in her urine, no casts, and it was of good specific gravity.

The second case was one in a child, aged ten, who developed albuminuria and dropsy six weeks after a slight sore throat. Notwithstanding ordinary treatment for acute nephritis the symptoms got worse, so that by the end of the second month the urine was scant, loaded with albumin, casts were abundant, and dropsy universal. There was constant febrile movement, attacks of vomiting, headache, and drowsiness. At the end of six months the child's state was most unsatisfactory, the serous sacs containing fluid, and paracentesis abdominis was practiced on two occasions. At the end of the seventh month decapsulation of the kidneys was resorted to under gas and ether with oxygen. The operation was

completed in thirty-five minutes, a great deal of fluid escaping from the lumbar incision. There was no difficulty in stripping the kidneys, which were found to be pale, mottled, and large in size in proportion to the child's age. The kidney substance was apparently not under any tension. The wounds healed well and there were no untoward after-symptoms. Free urinary flow was established almost at once and the edema rapidly diminished. Six months after the operation the patient was found to have slight edema of the face and feet at times with some albuminuria. Fifteen months after the operation there was an attack of nausea with slight increase in the edema and albumin. This flareup, however, was thought to be due to septic tonsils, which were removed three years after the decapsulation, and this procedure seems to have completed the girl's recovery, for since June, 1918, when the tonsils were removed, the patient has remained quite well and has grown to be a fine girl, plays hockey, lacrosse, dances, and is really "wonderful."

We have not space to detail the two cases which were not so successful, one of them being in a man of twenty-nine and another in a youth of eighteen. Neither of these cases suffered from as much edema as in the two detailed. Indeed the edema was comparatively slight. The urine was more free in both of them and contained less albumin and fewer casts. There was apparently, however, a greater tendency to vascular change in these two cases. In the adult the blood-pressure was 175 and in the youth 145. It is interesting to note that, in the first case, while there was a considerable increase in the secretion of urine during the first week after operation, this practically ended the period of improvement, and in the second case there was thought to be very slow general improvement, the most marked change perhaps being a fall in blood-pressure to 120 from 145.

These cases, with others which have been

reported in this country and abroad, certainly indicate that in certain conditions of the kidney decapsulation may be advantageous, and we quite agree with Horder when he says that there is a clinical type of nephritis in which when thorough general measures prove unavailing, decapsulation becomes a definite indication and promises satisfactory results. This type is subacute nephritis characterized by extensive and considerable edema, massive albuminuria with casts, toxic symptoms of the chronic uremic kind, and an absence, or the presence in only slight degree, of cardiovascular changes.

He admits that the process by which the effects of decapsulation are secured are unknown. Horder does not believe that it can be due to the formation of new vessels, because the results of decapsulation are immediate.

It is interesting in this connection to note that Sir D'Arcy Power, who operated on these cases, stated that in his opinion drainage was unnecessary, that some edema with ascites is no contraindication to operation, and that he thought both kidneys should be stripped at the same time, the capsule being cut away rather than left behind.

ACUTE DILATATION OF THE HEART.

Now and again one comes across terms in medical literature which seem to be adequate but which on analysis appear to mean very little. Many years ago before the introduction of instruments of precision, the diagnosis of "anemia" was often made in conditions of otherwise inexplicable ill health. Then "malaria" became the favorite term, and more recently unexplained illness is referred to as "influenza." In the same manner the term "acute dilatation of the heart" is often used when some accident occurs in the course of acute illness, or during, or after, a surgical operation. Levine has recently done well in calling

attention to the fact that there is little justification for the use of these terms. It may satisfy the relatives and friends, but the question arises as to whether the physician who uses these terms has really any data which justify him in the expression of such an opinion. The evidence at autopsy is not particularly convincing, and the condition is such, while life exists, that a careful physical examination and x -ray application are usually out of the question. It would seem probable that in many instances some disorder of cardiac action like auricular fibrillation or ventricular fibrillation is really present.

Levine reports upon nine cases occurring during or after surgical procedures in which the condition commonly called acute dilatation of the heart was observed. The value of his report consists in the fact that the condition of the heart was studied by modern methods, or in other words by the use of the electrocardiograph, instead of being guessed at. Each of the nine patients was found to have an abnormal auricular mechanism; three had paroxysmal auricular tachycardia; four had paroxysmal auricular fibrillation; and two had paroxysmal auricular flutter. In all but two of the cases the condition was transient. In non-surgical patients Levine claims that there is satisfactory x -ray evidence to support the view that the heart does not dilate when the well-known symptoms usually described by this term are manifest.

He gives the additional interesting information that direct pressure on the vagus, or ocular pressure, proved successful in arresting all three cases of paroxysmal auricular tachycardia.

We are glad to see that he expresses little faith in the diagnosis of cardiac dilatation arrived at by percussion. It may be true that in chronic conditions the size of the heart can be approximately determined by careful percussion, but in acute conditions arising in patients who have not been previously studied, this method of determining the size of the heart is unreliable and often mere guesswork.

SURGICAL TREATMENT OF GASTRIC ULCER.

This subject of major import to both surgeons and physicians, affecting a larger number of people than is customarily believed, often attended by no symptoms, or at least such symptoms as would not excite the attention of the average citizen, complicated by perforation and by at times colossal hemorrhage, is discussed in the *British Medical Journal* of July 24, 1920, by Moynihan, Mayo, and others. The particular value of this discussion is incident to the fact that these surgeons have themselves operated on thousands of cases, having had associated with them skilled internists, have achieved a degree of success in treatment practically undreamed of twenty years ago, and bring to the problem not only their technical knowledge, but a ripe judgment in which the general practitioner has learned to trust.

Moynihan notes as the first step in treatment the discovery of any sources of continuing infection which may have led to the development of the ulcer. The primary infection cannot always be discovered—indeed, cannot often be localized with certainty—but it is a fair assumption to make that any chronic infection of which the evidences are still discoverable may have acted as a cause of the original ulcer, or have provoked a recurrence of it in one or more of those attacks which are a characteristic feature of the clinical history. The causal infection may not be found until the abdomen is opened, for a large number of the cases of gastric ulcer upon which the surgeon must operate are secondary to an infection arising in some part of the intestinal canal, more especially in the appendix. But there are not a few cases in which the infective agent appears to reach the stomach by way of the mouth. Diseases of the teeth or gums, of the antrum or other accessory sinuses, or of the nasopharynx, have all been found.

One of the factors most certainly causing a recurrence of ulceration in the stom-

ach, or of ulceration at or near the suture line after gastroenterostomy has been performed, is infection derived from one or other of the several sources above indicated.

A successful operation upon a patient suffering from gastric or duodenal ulceration will depend in part upon careful and adequate preparation. Not a few of the patients are weakly, ill-nourished, and of a low resisting power when first they come under care. By keeping them at rest for a few days, giving them large quantities of fluid by the mouth, or by rectum, or subcutaneously; by the administration in such fluid of sodium carbonate or glucose; or occasionally by performing a direct transfusion of blood, their condition can be greatly benefited, and the risks of operation correspondingly reduced. The practice of withholding fluids for a few hours before operation is always a procedure of very questionable value; in patients reduced in strength by lack of nourishment, or by pain extending over long periods, it is positively a factor pregnant with harm. When the operation is performed the choice of hedonal as an anesthetic in exceptional circumstances is very helpful. The anesthesia is quietly induced, lasts long, gives remarkable relaxation of the abdominal wall, and provides two or three pints of fluid at a time when fluid is much needed.

As to gastroenterostomy, Moynihan states that in about 25 to 30 per cent of the cases of carcinoma of the stomach removed by operation the claim that the malignant change is imposed upon a simple one appears on pathological grounds to be irrefutable; and every surgeon knows that in a small number—not less, certainly, than 10 per cent—of the cases of gastric ulcer, to all appearances simple in character, a microscopic examination of the specimen removed by operation reveals the early stage of carcinoma.

In consequence of his experience Moynihan has abandoned gastroenterostomy alone in the treatment of chronic ulcer because

results were not as good as those following gastrectomy. The morbidity was greater, the return to health slower, the ability to take food early and generously was wanting, and more watchful after care was necessary. In patients returning for further care with the ulcer still open, a further operation was needed.

Some few cases returned with carcinoma of the stomach after so long an interval as to make it probable that the cancerous change had occurred after the operation had been performed.

There is evidence to show that gastric ulcer may develop, even after gastroenterostomy has been performed, when the stomach itself was normal.

Moynihan uses two layers of the finest chromic catgut sutures. The mortality in his hands during the last ten years is one per cent. He has had no death from the last 350 cases of duodenal ulcer. The operation of excision was introduced with great hopes, which unhappily have not been gratified. Collinson found that in 39 cases of excision there were 15 in which severe recurrence was observed. Eleven patients were submitted to a second operation, and seven of them showed active ulceration at the site of the excision. One developed a fresh ulcer distal to the original one, and three had extensive adhesions which crippled the action of the stomach.

Excision by knife or by cautery combined with gastroenterostomy Moynihan speaks of with some enthusiasm; indeed, he says that of all methods of dealing with gastric ulcer short of gastrectomy it is one of the best. He speaks of Balfour's technique, replacing the method of excision of the ulcer by that of its complete destruction by the actual cautery, as a notable advance. His experience with this method has, however, been limited, as he has become more and more radical in the treatment of gastric ulcer, and he considers the removal of part of the stomach as the operation of choice. There are ulcers of the stomach

so large, so awkwardly placed, and so deeply penetrating the liver, or the pancreas, in patients whose general condition is so poor that any operation becomes serious. Such cases may be unsuitable for Balfour's operation, by reason of the size or remoteness of the ulcer.

In performing the operation of gastroenterostomy, the intestine is cut across about 18 inches below the flexure, the distal end closed, and the side of this distal part united to the anterior wall of the stomach. As large an opening as possible is made proximal to, or in the zone of, the ulcer and extending sometimes over the fundus of the stomach. The proximal divided end of the jejunum is then anastomosed to the side of the distal limb a few inches below the gastroenterostomy opening. Into this proximal part, at a point about three inches above the junction which has just been made with the distal limb, a tube is introduced and fixed by the method of Witzel. The tube passes for several inches down through the enteroanastomosis into the jejunum. It is brought out of the abdominal wall through a small separate incision to the left of the umbilicus. It is through this tube that all nourishment is given for months, or for years, until a radiological examination shows that the ulcer is healed, or until a trial of one month, during which food is given, discloses no return of the symptoms. During this time the greatest care is taken to keep the mouth clean by friction and frequent washing. Up to the present time, in no case in which this operation has been practiced has the ulcer returned.

Moynihan holds that far greater seriousness attaches to gastric ulcer than duodenal ulcer. Operations upon it are more serious, partly by reason of the extent of the operations themselves, chiefly in consequence of the less robust state of the patients. Recoveries after operation are fewer whatever the nature of the operation, and the rate of mortality of the patients in the years subsequent to operation, as Balfour has

recently shown in a paper of great value and of new significance, is, in the cases attended in the Mayo clinic, three times as high as in patients operated upon for duodenal ulcer. This on reflection is not so startling a fact as may at first appear; for many of the patients suffering from duodenal ulcer are men otherwise of robust strength and splendid health.

A duodenal ulcer is often a simple round "terraced" ulcer affecting the intestine alone; a gastric ulcer is very prone to extend and to burrow deeply into other parts—the pancreas, the liver, the abdominal wall; and the later history of the two diseases is very different.

Moynihan has always done partial gastrectomy whenever it can be safely performed. The risk is not great: over a period of ten years it is not more than 2.5 per cent. All things considered, and account being taken of the five years succeeding operation, it is probably a safer operation and is certainly a more immediately satisfactory one than gastroenterostomy alone. It cannot always be practiced. The condition of the patient may forbid it. The ulcer may be so large and so placed as to make removal a matter of so great technical difficulty that the immediate hazards are unfair to the patient. But as experience grows the number of such cases diminishes.

The duodenum is divided just beyond the pylorus, after ligature of the pyloric and gastroduodenal arteries. An opening is made in the transverse mesocolon, in the arch of the anastomosis of Riolan, in order to guide the surgeon in his ligature of the omentum below the greater curvature, so that the middle colic artery may be avoided, and in order that the conditions at the back of the stomach may be early and fully investigated. After division of the great omentum as far toward the left as the point at which the stomach is to be divided, the whole organ is turned over the left edge of the parietal wound, until the coronary artery is brought into view and ligatured

with great ease at exactly the place required. As soon as this vessel is cut an anchor is let go, and the stomach is moved more freely. Then while the stomach is held as a retractor an anastomosis is made between it and the jejunum.

Moynihan always applies the end of the stomach to the side of the jejunum. To prevent bilious vomiting he usually divides the jejunum completely across, about eight to ten inches below the duodenojejunal flexure, closes the distal end, and makes an anastomosis in "Y." The patients do not have a protracted convalescence, nor has a single case shown recurrence.

Moynihan records 805 operations with 12 deaths, a mortality of 1.23 per cent.

Mayo notes that gastric ulcer is a comparatively rare disease, representing but a fraction of 1 per cent of the findings at general autopsies. The proportion of gastric to duodenal ulcers is approximately 1 to 4. In the Mayo Clinic reports both gastric and duodenal ulcers were found in the same patient. Mayo believes that in the chemistry of the bacterial products lies the explanation of the chronicity of the disease.

Ulcer is undoubtedly developed by a combination of local chemical effects, or by direct interference with the circulation through infarction emboli of bacteria. Mayo states that in 1191 cases of gastric ulcer the mortality was three times as great as that in duodenal ulcer. A stomach which has developed qualitative food dyspepsia rarely has an ulcer, but represents a gastric reflex appearing within the half-hour, while quantitative food dyspepsia is usually associated with interference of peristalsis, which, if intestinal, appears at the end of the first hour.

In true ulcer hemorrhage is a symptom in approximately 20 per cent of the cases. No attention is paid to occult blood. The x-ray diagnosis has been made in 95 per cent of cases. Mayo believes that the control of the acid limits peptic activity and

gives relief of symptoms. Nevertheless treatment but tides the patient through the exacerbation and does not cure permanently. Of 638 patients with calloused ulcer of the stomach, the average mortality was 3.2 per cent, more than double the average mortality of nearly three thousand patients suffering from duodenal ulcer. Most of the ulcers were in the lesser curvature.

Hunter, actuary of the New York Life Insurance Company, in an investigation at the clinic of the results of operation in a large series of cases of gastric and duodenal ulcers, found that the average death-rate for the four-year period after operation in patients with gastric ulcers was slightly more than three times the normal, while in the duodenal ulcers it was slightly less than normal. The series consisted of 2431 patients, and all but 108 were traced.

If it is true that the majority of the cases of duodenal and gastric ulcer have an average duration of a number of years, many extending from twenty to thirty years, it is probable that there is an exaggerated idea of the danger to life. Few persons die from perforation, and few from hemorrhage—more, however, than die from surgical procedures. It is true that they suffer, are disabled, and should be relieved; and it is also probable that but a small percentage of the total number of ulcers are recognized or treated for the true condition. Gastric ulcers may give greater discomfort than duodenal ulcers, and because of the danger of malignant degeneration should be destroyed at the time of the operation unless this procedure would add unwarranted immediate risk.

In the discussion, to which the other contributors do not greatly add, Moynihan calls attention to the fact that hyperchlorhydria is not the rule in cases of gastric ulcer. In his own cases it has been present in less than 30 per cent. Smithies has shown that in 2168 cases of proved gastric ulcer (which is quite a different

thing from "gastric ulcer") the free HCl values were absent or below normal in 33.4 per cent. Therefore the "physiological" value of the operation can only be necessary in one-third of the cases; and in none of the cases is there yet any proof that an ulcer of the stomach heals better in an alkaline than in an acid medium. But if a physiological result is needed, gastro-enterostomy is not the best method of producing it; it would be better to join the gall-bladder to the stomach.

SOME LABORATORY CONTRIBUTIONS TO SURGERY.

In the November number of *The Military Surgeon*, there appears an article setting forth the war work of the Rockefeller Institute, describing the laboratory and practical schools there established for the education of the medical officer, and naming the valuable contributions made by this institution and the efforts toward installing a better appreciation of the fundamental principles on which good surgery is based and a better application of these principles to the relief of those suffering from infections.

In this school animals were employed to demonstrate that regarding the treatment of tetanus there are three points of cardinal importance: (1) The removal of the primary cause by proper surgical methods; (2) the neutralization of the free toxin in the blood and the lymph by means of a thorough serum treatment; (3) the treatment of the tetanic manifestations after the toxin is once fixed in the nerve cells and thus is unamenable to the neutralizing action of the antiserum. Here chiefly the treatment by magnesium is indicated.

The action of magnesium was demonstrated by actual experiments on tetanic dogs: (1) Animals in a severe and dangerous state of tetanus were relieved and restored to nearly normal within a few minutes by a judicious intravenous injection of

magnesium sulphate; (2) in another experiment it was shown that an injudicious administration of the magnesium salt may endanger the animal's life; (3) it was finally shown that tetanic animals which received intentionally too much magnesium and thus were in imminent danger could be saved in a few minutes by an intravenous injection of a normal solution of calcium chloride. There were animals in which after receiving a very large dose of magnesium the respiration was completely abolished and the heart's action could not be felt any more; they were nevertheless resuscitated by means of calcium; and with pharyngeal insufflation.

Concerning the chlorine compounds it was shown that Dakin's hypochlorite solution and chloramine-T solution quickly destroyed the exotoxin (Bull) of *B. welchii*, the toxins of diphtheria and tetanus bacilli, and the venoms of *crotalus* and *naja* species of serpents.

Other chlorine compounds showed no appreciable solvent action on blood clot, and hence arises the advisability of a proper mechanical cleansing in order to prevent blood clot which may harbor bacteria.

It will be remembered that after the Institute had demonstrated the value of serums in the treatment of epidemic meningitis and pneumonia their manufacture was taken over by commercial firms. These, however, produced a product so unreliable that at the request of the British authorities the Rockefeller Institute again resumed their preparation. During this period it supplied serum without cost to the army and navy, and to the civilian population of England, and smaller quantities to France, Belgium, and Italy.

For the most part the antimeningococcic serum produced was polyvalent, and in its preparation a considerable number of strains (as many as 51) of meningococcus were employed for inoculation. Representative strains fresh from the human host were introduced continually in order to

maintain wide potency in the serum. These strains included representatives of the normal and parameningococcic, differing but slightly in their agglutinative qualities; and then representatives of the intermediate strains between the two main types, in which the agglutinative differences were more marked. Toward the end of the war period this number of strains was materially reduced, and simplifications of this and other kinds were introduced into the manufacture of the serum which considerably diminish the cost and labor incident to the process.

The antipneumococcic sera types I, II, and III were produced in considerable quantity for diagnostic so-called "typing" purposes. According to this process, cases of pneumonia due to pneumococcus are differentiated according as they are incited by pneumococcus type I, II, or III, or one of the more miscellaneous pneumococci assembled under the designation type IV. No therapeutically satisfactory serum has been produced for the so-called types II, III, and IV pneumonia. Hence it is essentially unscientific to treat cases of lobar pneumonia with so-called polyvalent serum. The clinical evidence, on the other hand, supports the value of an effective type I serum.

The titration of the type I serum is made by protection tests on mice. White mice are given intraperitoneally varying doses of pneumococci, and at the same time a fixed quantity of immune serum. Animals surviving for five days are considered as being effectively protected. All animals, except the virulent controls, receive 0.2 Cc. of immune serum intraperitoneally. Serum of type I in quantities of 0.2 Cc. uniformly protects against 0.1 Cc. of a broth culture of the homologous organism, which kills regularly in doses of 0.000001 Cc. This measure of the protective power of type I antipneumococcus serum has been adopted as the standard of potency for therapeutic use.

The therapeutic type I serum is prepared in the horse by injecting the animal intravenously with gradually increasing doses of killed, and finally highly virulent, cultures of pneumococcus type I. An immune serum produced in this manner is found to possess a specific action against all organisms of type I. This serum is also applicable for typing pneumococcus I. The diagnostic or typing sera II and III are also prepared in the horse in the same manner.

In order to apply serum treatment in any individual case, it is essential to have a method of determining very promptly after the patient comes under observation the type of organism concerned. This may be done by injecting into the abdominal cavity of a mouse a portion of sputum coughed up from the lung of the patient. After sufficient growth has occurred, usually in from six to eight hours, the mouse is killed, the abdominal cavity washed out, and the blood cells and fibrin thrown out by slow centrifugation. In this manner a suspension of organisms is obtained, and the agglutination test can be carried out immediately. If mice are not available, a rapid culture method has been devised whereby growth of the organism from sputum is greatly facilitated by the use of a special medium. In addition to the special technique developed for the determination of types of pneumococcus in sputum, cultures of the organisms from the blood, from spinal fluids, or exudate of empyema, may be typed by the use of the agglutination reaction, or the precipitin test.

Demands for antidysenteric serum first came from France. For therapeutic purposes a polyvalent serum was produced by inoculating cultures of *B. dysenteriae*, Shiga, Flexner, Y, and Strong. The rapid method of immunization was employed also in the production of this serum.

The polyvalent antidysenteric serum was used also for the identification of dysentery bacilli by the agglutination test, for which

it was supplied to camp and private laboratories.

During the period of production of the antidysenteric serum, an experimental study was conducted on the nature of the toxin of the Shiga bacillus. This toxin, as present in cultures or extracted from the bacilli, was determined by Olitsky and Kligler not to be a simple substance, but to be composed of two poisons. These two poisons could be separated experimentally and were found to consist of the exotoxin, which has an affinity chiefly for the nervous system and is neutralizable in multiple proportion by its corresponding antitoxin, and the endotoxin whose affinity is for the enteric system, and cannot be neutralized by its antiserum in multiple proportion.

Gaseous gangrene became a very serious form of war-wound infection. Until late in the war period, gaseous gangrene was viewed chiefly as an infection with *B. welchii*; later the important fact emerged that a number of anaerobic bacilli of the soil were responsible for and often co-operated in producing this condition. On account of this consideration, the wide applicability which it was hoped that the anti-*B. welchii* serum would have, both as a preventive of and treatment for gaseous gangrene, was not realized. Nevertheless, the fundamental studies of Bull on the exotoxin of *B. welchii* remain a milestone in the unraveling of the pathology of gaseous gangrene and contributed essentially to the perfection, toward the end of the war, of a polyvalent prophylactic and curative serum, covering the anaerobic, gangrene-producing bacilli responsible for the several varieties of gaseous gangrene of infected war wounds.

Horses have been immunized with the toxin and made to yield antitoxin of high neutralization value or titre. With this antitoxin a number of cases of gas gangrene, arising in industrial accidents, etc., have been treated successfully. Considerable quantities of the serum were sent to

France. Its employment was more or less disappointing, for the reason stated above, namely, that gas gangrene is rarely a mono-infection with *B. welchii*, but usually a polyinfection with several distinct anaerobic bacilli. The other important anaerobes found in infected wounds are: *Vibrio septique*, *B. sporogenes*, *oedematiens*, *bellonensis*, *histolyticus*, *tetani*, *putrificus*, *fallax*. A number of other unidentified anaerobes have also been isolated. The mere control, therefore, of intoxication by *B. welchii*, and even the suppression in the wound of that bacillus, is inadequate. However, in producing a polyvalent anti-gas gangrene serum, the method of securing the toxin discovered by Bull is employed with the other anaerobes for which a polyvalent antitoxic serum giving promising clinical results has been produced.

The sources of infection in such diseases as epidemic meningitis and lobar pneumonia may be regarded, for all practical purposes, to be personal, and the mode of infection always to be via the respiratory mucous membranes. In these two diseases, the inciting microorganisms—meningococcus and pneumococcus—are contained within the secretions of the nasopharynx of cases of epidemic meningitis and lobar pneumonia, of chronic carriers who have passed through attacks of those diseases, and of healthy carriers of the respective microorganisms.

Under circumstances of camp organization, protection has been sought first through early hospitalization of cases, next according to the disease (meningitis) by the detection and abstraction of carriers, and third by the inoculation of killed cultures of the several inciting bacteria in an effort to prevent infection through a process of active immunization.

The observation has repeatedly been made that chronic carriers of the meningococcus themselves rarely become ill with meningitis. Hence another factor besides the presence of the meningococcus in large

numbers in the nasopharynx, and over long periods of time, is required in order that infection of the meninges may occur.

The study on the effects of vaccination with the meningococcus was carried out at Camp Funston by Lieutenant Gates. The essential point of this study is that inoculation with killed meningococci is easily practicable and is followed promptly by the appearance of antibodies for that micro-organism in the blood; and similar antibodies are detectable in the blood of chronic healthy carriers of the meningococcus who have long been able to escape infection of the meninges.

That the incidence of lobar pneumonia may be reduced by protective inoculations of killed type cultures of the pneumococcus was shown clearly by Lister in South Africa. As pneumonia claims so high a percentage of the deaths from disease in camp life, an effort to reduce the morbidity incidence by vaccination was undertaken.

The inoculations were carried out at Camp Upton on 12,519 men. Prophylactic vaccination against pneumococcus of types I, II, and III is practical and apparently gives protection against pneumonia produced by these types. It remains to be determined how long this immunity persists.

Under circumstances of wide prevalence of bacillary dysentery, it would appear that analogy with the mode of infection in typhoid fever should subject this condition to control by means of prophylactic vaccination. Hence a study was begun of the possible value of an oily suspension of the killed dysenteric bacilli for this purpose.

The oil acts as a passive agent in merely

suspending the bacteria without altering their properties. The slow absorption of the suspended bacteria from this vehicle mitigates the toxic effects of the dysentery bacilli. At the same time it does not interfere with the immunity response — anti-bacterial and antitoxic.

As a result of the slow absorption of the dysentery bacilli from the oily suspension, only slight local and general reactions follow, and it is possible to give at one time and in a single dose a sufficient number of the killed dysentery bacilli to incite a high degree of immunity.

The experiments on animals and a small number of tests on man indicate that the single injection of an almond oil suspension of the Shiga and Flexner groups of dysentery bacilli suffices to afford protection, as indicated by the appearance in the blood of definite specific antibodies for each group of the bacilli, and by the protection of animals from otherwise lethal doses of the living organisms or their toxic products. The extent to which vaccination should be applied to man will depend on circumstances and conditions still to be defined, but the method appears to be wholly practicable.

The question of the disposition of the chronic meningococcus carrier, in military life, is a very difficult one when the carrier state persists, as it sometimes does, for many months.

Of twenty-three carriers 20 cleared up and were discharged free of meningococci of the nasopharynx, this after the removal of adenoids, tonsillectomy, and the draining of sinuses and exposure to a vapor of chloramine-T for a period of 40 minutes three times a day.



Progress in Therapeutics

Medical Therapeutics

Acute Methyl Alcohol Poisoning.

ISAACS, in the *Journal of the American Medical Association* of September 11, 1920, states that various treatments have been recommended. These consist of stimulants, as caffeine, adrenalin, strychnine, digitalis, camphor, oxygen, pilocarpine, and also potassium iodide. Gettler and St. George suggested saline or sodium bicarbonate infusions and phlebotomy, with repeated gastric and rectal lavage. Fenton reports a case of blindness in which the patient recovered after the instillation of ethylmorphine hydrochloride (dionin) into the eyes. The patient was also taking sodium bicarbonate freely by mouth. Harrop and Benedict report the recovery of a patient following 5-per-cent solution of sodium bicarbonate intravenously.

The plan of treatment is based on alkalization and elimination. If the patient is not comatose, and is received within twelve hours after taking the wood alcohol, it is well to pass a stomach tube and wash out the contents with a 1- or 2-per-cent solution of sodium bicarbonate in warm water, as experience has shown that some of the alcohol is excreted into the stomach. Three or four ounces of a 50-per-cent solution of magnesium sulphate are then carefully poured in through the tube and left in the stomach. Sometimes an hour or more after washing the patient will vomit a considerable amount of food debris having a marked odor of methyl alcohol. The patient is put to bed, kept warm if his temperature is low, and is given 3 gm. (45 grains) of sodium bicarbonate, with about 250 Cc. of water every two hours, for about six doses, being awakened for his medication if asleep. Sometimes a whiff or two of aromatic spirits of ammonia will serve to awaken the patient enough to make him swallow. The dose of bicarbonate may be doubled without appar-

ent ill effects. After this the patient is given 3 gm. (45 grains) of sodium bicarbonate with a glass of water, three times a day, one hour before meals, until the symptoms have disappeared. A safe guide as to the dose is to keep the fresh urine alkaline to methyl red. Fluids are forced, and a liquid diet is given until the acute symptoms are over. Then the diet may be as varied as the patient wishes.

If the patient is comatose, or if the cyanosis is very marked, with respiration much depressed, it is well not to wash out the stomach at first. In this case, or if medication by mouth is not retained, 1000 Cc. of Fischer's sodium carbonate (0.37 per cent) or sodium chloride (1.4 per cent) solution at 99° F. is given slowly intravenously. In case of any doubt, it has been his custom to give the intravenous injection. No ill effects have been noted. If there is time and there seems to be congestion of the venous circulation from embarrassment of the right side of the heart, it may be well to draw off from 100 to 300 Cc. of blood before giving the intravenous injection. Half may be given at one time, and the other half later. It has usually not been necessary to give a second intravenous injection on succeeding days. A spinal puncture may be made if there is much restlessness and if there are signs of cerebral compression. After Fischer's solution there appears to be a dehydration of the nervous tissue, with increase in spinal fluid. The breathing usually improves rapidly, the mental state clears, and in from six to twelve hours the cyanosis has virtually disappeared. There is rapid improvement in the eye signs, the blurring of vision disappearing in from twelve to twenty-four hours, or sometimes a slightly longer period. The abdominal tenderness soon disappears.

It is well for the patient to remain in bed until the cyanosis has disappeared and

the mental confusion has cleared. The bowels should be kept open with magnesium sulphate. The average stay in the hospital was about five days, with treatment for two or three days. It is well to have the patient return at intervals to note whether or not there has been any permanent damage. All his patients have had homatropine or atropine sulphate dropped into their eyes for ophthalmoscopic examination.

The toxic symptoms are produced by widely different amounts in different individuals. The blurring of vision varied from inability to count fingers held about a foot in front of the eyes to inability to read ordinary newspaper print, but with enough light perception to count fingers. These conditions had cleared up entirely at the time of discharge.

Issacs concludes as follows:

1. Wood alcohol appears to vary in its toxicity to different individuals.
2. The symptoms are those of depression of the medulla and the cranial autonomic system, and at times the sacral. There is usually a marked and early effect on vision.
3. There is a rapid disappearance of the symptoms (unless the anatomic injury is beyond repair) with intensive alkali therapy.
4. Many of the toxic symptoms probably accompany the acidosis, which may be associated with the acid production (formic) and with methemoglobinemia.

Mercurochrome-220: Its Use in Ophthalmology.

LANCASTER, BURNETT and GAUS, in the *Journal of the American Medical Association* for September, 1920, state that in acute infections of the conjunctiva a 1-per-cent or 2-per-cent solution of mercurochrome-220 was instilled, from one to several drops at a time, from three to ten times a day. The secretion of mucus and pus was very rapidly diminished, often strikingly so. The same is true of many other drugs, however. It is their opinion that a more rapid reduction of discharge takes place

under mercurochrome-220 than under zinc sulphate, boric acid, argyrol, or mercuric chloride, which are the drugs they most frequently employ.

It is particularly gratifying to see a conjunctivitis following an operation on the eyeball respond to mercurochrome-220. If on removing a dressing they find a notable amount of discharge, they use mercurochrome-220, 1 per cent, three times a day, and expect to find a marked improvement the following morning. The combined effect of the trauma of the operation and the bandage often sets up an increased discharge from the conjunctival sac; and this is more promptly and surely arrested by mercurochrome than by any other treatment they have tried.

In plastic operations in which skin grafts are used, it is not uncommon for an offensive odor to appear after a few days, showing the growth of saprophytic organisms; 1-per-cent mercurochrome-220 in small doses applied twice or three times a day will promptly stop the odor, not by its deodorizing but by its antiseptic action.

In ulcers the drug shows by its staining quality that it penetrates the infiltrated zone.

Cardiovascular Response to Injections of Adrenalin.

The *British Medical Journal* of September 25, 1920, in commenting editorially on this subject, says hypodermic injections of adrenalin are so frequently employed as an efficient remedy in asthma, and are now becoming—at any rate in America—such a routine diagnostic procedure in the detection of thyroid intoxication, that information about the reactions thus induced is interesting. Individuals vary much in the cardiovascular response to these subcutaneous injections, and very unpleasant symptoms, such as palpitation, throbbing in the head, tremors, shivering, nervousness, distress, and precordial pain of an anginoid character, may follow; the physical signs include a rise in systolic pressure, increase of the pulse pressure, or the difference be-

tween the systolic and diastolic pressures, rapid pulse, mydriasis, and glycosuria. As is well known, Eppinger and Hess, who introduced the conception of vagotonia and sympathicotonia, considered that persons with an excess of adrenalin and increased tonicity of the sympathetic (as distinguished from the autonomic or parasympathetic) system were characterized by a well-marked response to adrenalin.

This explanation has met with more criticism than confirmation, and Clough, in "a study of the cardiovascular reaction to adrenalin and adrenalin sensitiveness in patients with hypertension," will have none of it. He gave hypodermic injections of 1 Cc. of Parke, Davis & Company's 1-in-1000 adrenalin solution to 95 persons, 32 of whom were regarded as normal subjects, and on the basis of the cardiovascular response, as judged by the degree of rise in the systolic blood-pressure, of the increase in the pulse pressure, and the acceleration of the pulse, divide them into four groups—namely, those with a negative or insignificant reaction, a moderate, a well-marked, and a very well-marked reaction. Of the two factors—direct stimulation of the heart and vasoconstriction—the first plays the chief part in moderate reactions, whereas in severe reactions the second is also of importance. Out of the 32 normal persons 82 per cent gave an insignificant or moderate reaction. The most striking point among these observations was the frequency of a well-marked reaction in patients with a high blood-pressure, which was taken as 155 mm. Hg. or more; out of 22 such patients 15, or 68 per cent, were found to show marked reactions to adrenalin, whereas such reactions were obtained in only 26 per cent of the other 68 cases, and in 18 per cent of the 32 normal subjects. In none of these 15 cases were there any noteworthy sympathicotonic symptoms as formulated by Eppinger and Hess.

In his critical discussion of the significance of this sensitiveness to adrenalin on the part of persons with a high blood-pressure, Clough, controverting the usual opinion, concludes that it is now well estab-

lished that adrenalin is not a direct means of maintaining the blood-pressure at the normal level, and, further, that in spite of a number of positive results which are shown to be open to fallacy, there is not any satisfactory direct proof of an increased amount of adrenalin in the blood in human disease, or that high blood-pressure is due to or associated with adrenal overactivity or "hyperadrenalinemia."

In the great majority of patients with high blood-pressure there is no evidence of any thyroid disturbance, and it is therefore doubtful if there is any direct relation between the two conditions. The sensitiveness to adrenalin of patients with a high blood-pressure is very probably only one of the manifestations of a general abnormal reactivity of the cardiovascular system, such patients often showing an unusually well-marked blood-pressure response to exercise, emotion, or excitement. These are, of course, the conditions in which Professor Cannon and others believe that an increased secretion of adrenalin occurs, but, as mentioned above, Clough does not accept this conclusion, and he considers that this sensitiveness may be due to an abnormal state of the sympathetic or the nerve endings without its being necessary to assume overactivity of either the chromaffin system or of the thyroid.

Puerperal Sepsis and its Treatment.

TITUS, in the *Boston Medical and Surgical Journal* of September 23, 1920, points out that in puerperal sepsis nature attempts to localize the inflammatory area by a leucocytic wall, and pathology teaches that when the curette, no matter how gently used, goes into the infected uterus it breaks down this leucocytic wall in its attempt to remove the infection and lays open new areas for further infection. Consequently the curette defeats its own purpose. It makes a bad matter very much worse.

Referring to the rationale of antiseptic douches he reminds us that many sorts have been used from time to time: corrosive in the strength of 1:3000; alcohol, 70 per cent;

lysol, etc. Bacteriologists teach us that a solution of one to three thousand corrosive takes many minutes to kill the ordinary pyogenic organism when it is lying in the solution. The same is true of alcohol. When a douche is used, the return flow will make up almost the entire amount that has been used; not more than an ounce or so will remain in the uterus, and when this solution mixes with blood coagulation occurs, searing off the uterine cavity. If this is so, how many organisms that are doing harm in the uterine mucosa are attacked by this solution sufficiently to destroy them? Douches given for the purpose of washing detritus from the uterine cavity are rational; douches to combat organisms in the uterine mucosa cannot expect to attain the result desired. So frequently, following intrauterine douches, a severe constitutional reaction is seen that it seems hardly wise to resort to these douches unless something definite for the patient's good is to be obtained.

If nature successfully combats the infection and localizes it in the uterine wall, the patient will get well with no other surgical treatment. Fresh air, as in the severe hemolytic invasions, is the most important single detail; plenty of good food, catharsis, alcohol baths, and general hygiene, just as any one would treat any medical disease, until the formation of pus has taken place, which always requires drainage. These patients, too, are sat up in bed, ice is applied to the fundus, ergot given empirically; and nothing else should be done.

If the disease remains localized in the uterus and it is not spread by uterine injury, it will run its course from a few days to several weeks, depending upon the virulence of the invading organisms and the patient's resistance. One should watch during the convalescence of such a patient for signs of parametric infection. They show by a rise in temperature after it has been somewhat lower, and pain and tenderness by palpation over the affected parametrium. It is fortunately true in puerperal infection of the pelvis that nature surrounds the affected site with layer upon

layer of exudate, attempting to localize such infections in the pelvis. The result is, as is not true in appendicitis, that the invasion of the general abdominal cavity is unusual. The treatment of the infection that has gone outside the uterus, showing its localization on one side or the other, is ice over the site, careful watching of the patient, and vaginal examination from time to time to watch for the gravitation of pus into the fossa of Douglass. When this occurs vaginal puncture will relieve the abscess. Going into the abscess from above is almost never indicated, and usually is quite hazardous. Infections that go outside the uterus may follow the round ligament to the abdominal wall, where localized abscesses may point, and when they do surgery is indicated to evacuate them. The lymphatic chains that follow the ureters to the kidneys are oftentimes invaded, so that perinephritic abscesses following puerperal sepsis are not uncommon and indicate drainage, as does pus anywhere else in the body. The blood-stream becomes infected, and general septicemia results, if nature's leucocytic wall has not been sufficient to localize the condition. The patient must be treated for general sepsis, and whether she recovers or not depends much upon her resistance. Those cases which live months with sepsis are often of the pyemic variety; each abscess as it develops indicates surgery, but until an abscess is definitely diagnosed surgery is of no avail. These septic cases are medical, as is pneumonia until it develops as empyema, until they develop pus. Surgery in the puerperium means the evacuation of pus; it holds almost no other function.

The staphylococci characteristically are more gradual in their onset than streptococci, the temperature taking several days to reach its height before maintaining its level. It is often of the step-ladder character. The pulse ranges from 110 to 120. The uterus in these cases on the third or fourth day is not hard, it is not small; it is tender, and the lochia contains pus. Intrauterine treatment, either the douche or the curette, is no more rational here

than in the previous type. Nature's walling-off process is less destructive and far safer. The empirical treatment—fresh air, elevation of the head of the patient, hygiene, ice, and ergot—will maintain the patient's resistance, favor localization processes in the pelvis, aid drainage, and do, what is most important, no harm.

This condition may last a few days with a subsequent drop to normal of the temperature, providing, of course, that nature has been successful in her attempt to prevent further infection.

On the other hand, infection into the blood-stream by continuity into the surrounding tissues, by the lymphatics to the kidneys, may occur. These extensions are to be treated symptomatically just as the invasion of bacteria in any other part of the body is to be treated, until localized pus develops, and this often never will occur.

No one thinks nowadays, when a streptococcus throat has resulted in a septicemia, to remove the tonsils. To be sure the tonsil is the source of the infection, but when the streptococcus is in the blood, treatment directed to the tonsil is of no avail, and so with the uterus. If there were any means of dealing intelligently with early uterine sepsis locally before extension could occur, it would be the only rational treatment, but pathology teaches us that nature's defense is far more adequate than any intrauterine manipulation that we know of to-day.

Spinal Anesthesia in Obstetrics.

Writing in the *Southern California Practitioner* for September, 1920, COOKE states that following spinal injection there is no pain, because the dilating tissues causing the pain have been desensitized by it.

The patient is conscious because no general anesthetic has been given, the woman can talk and coöperate and follow directions.

Consciousness.—When one gives the mother a general anesthetic, both the mother and the baby are unconscious, and instruments have to be used, and the baby

resuscitated. When "twilight sleep" is used, it also affects the baby through the mother's circulation, and frequently the child is born without respiration or is asphyxiated from the morphine, and it has to be resuscitated or is dead. The method is long drawn out, dangerous, and needs constant supervision. Nitrous oxide, as is well known, is a poor relaxing agent, consequently an unsatisfactory dilator; it relieves the sharper pains, but in larger doses is a general anesthetic; it is pleasant to take, is spectacular for the patient, but ether frequently has to be added at the last for relaxation and the forceps used. Then there is the old obstetrical standby chloroform, the less used the better, also a circulatory anesthetic affecting the baby; and finally ether, with its mucus, also a circulatory anesthetic. After all Cæsarian sections under ether the baby has to be resuscitated. All four of these methods leave much to be desired, all affecting the circulation. They are not of much, if any, value for either the doctor, nurse, or patient. If given to the extent of obliterating all pain, they cause unconsciousness, anesthetize the child, and cause additional care for the doctor and nurse. There is frequently vomiting and disturbed nutrition and distress for the patient to the extent that they all say, "Never again for me," and this may make an abortionist out of the woman.

In contrast to these conditions, what can we expect from the painless conscious method?

The patient is not nauseated, does not vomit.

There is no interference with nutrition. Patient can have cracked ice, or can eat or drink moderately, if she wishes, and thus be refreshed.

Even the injection causes very slight pain, if dexterously given, not as much as does the average hypodermic injection into the arm.

If the patient has had some severe pains before injection there is immediate relief after the injection, usually in a half minute. Then there is usually a resting stage of twenty minutes, maybe a little longer, and

possibly no perceptible uterine contractions, but completion of the dilatation of the cervix and relaxation of the pelvic floor are progressing as the child is settling down into the birth canal. Then gradually uterine contractions return and increase in intensity, as the woman does not now inhibit them, for the pain reflex has been obliterated, and the child is soon born crying. The birth is not precipitate; it simulates a normal birth, but without the pain and discomfort. Cooke's first case, before he withdrew the needle from between the vertebræ, said, "Why, doctor, my pain is gone. Oh, such a relief!" This case, while not a representative case for the method, was delivered with low forceps, a slight tear and a repair, totaling thirty-five minutes, all without pain. He believes that if she had been left a half-hour longer she would have delivered herself without pain after the injection, but he was not sure of that at the time, and the obstetrician was anxious to get away to another case, with the above result, which was highly satisfactory to all concerned, and especially to him, as it confirmed his ideas in several ways.

The relaxation is complete, and there are no tears due to pain contraction reducing the size of the outlet.

Tears, if any, are due to the abnormality in size of the parts and would be inevitable with any method, but can be repaired at once without pain.

If operative procedures are necessary, such as sutures, breech extraction, or version, there is full dilatation and relaxation and no pain sense.

The baby is not affected at all, and cries at once (a great relief to the doctor), is not cyanotic, and does not have to be resuscitated.

This is not a circulatory anesthetic, but a nerve inhibitor; there is no nerve connection between the mother's sensory nerves and any of the nerves of the child.

There are less detrimental effects to the kidneys by this method than any other; in eclampsia cases spinal anesthesia lowers blood-pressure, and while the needle is in the spinal canal one can relieve the pressure

of the spinal fluid by removing 20 or 30 Cc. of fluid and reducing the pressure. The anesthetic acts in less than a minute, aids in dilatation of the cervix, and allows one to empty the uterus quicker than by any other known method, which may save many precious minutes at this time and may save two lives. He especially recommends this feature in eclampsia cases.

If one has obstetrical cases complicated with heart, lung or kidney pathology, such as influenza or pneumonia, spinal analgesia is the choice of anesthetics, because inspiration anesthesia, such as ether or chloroform, is out of the question, and even nitrous oxide could not be used; and as anesthesia cannot be obtained with oxygen alone, one can conceive how important this method is in these cases.

Cooke has had two cases of primiparas that delivered in two hours from the time of injection, by their own powers, without morphine or atropine to aid the anesthetic, or any pituitrin to aid the fundus in contracting.

It is his opinion that pituitrin can be given and that it will act synergistically, but as the spinal injection gets the relaxation and removes the opposition a less number of contractions are necessary; there is less uterine inertia, and less need for pituitrin. This is how it shortens the second stage.

The mother is not so worn out and returns to her bed in excellent condition, with no after-effects except return of sensation.

The time of the second stage can, in some instances, be reduced three-fourths.

The more pathological the case the more satisfactorily will spinal injection show up by comparison.

There is the least amount of absorption of a poison in the system than by any other method of anesthesia it can be compared with, consequently the after-effects are *nil*.

Cooke believes that as soon as this method becomes known by women generally, and they understand the relief that they can obtain from it, they will be clamoring for it and we will have to use it to satisfy them.

The Uselessness of Antimony in the Treatment of Filariasis.

Low and GREGG, in the *Lancet* of September 11, 1920, refer to a report made by Leonard Rogers upon antimony injections given intravenously for the treatment of filariasis, he having pointed out that very careful and prolonged counts are necessary before coming to a conclusion as to the efficacy of this treatment. Rogers's results, on the whole, appear to indicate that these injections have a definite effect in greatly reducing the filarial embryos or causing them to disappear from the peripheral blood, presumably as a result of the destruction of the adult worms.

In a case of their own tartar emetic injections were given intravenously in the usual manner, commencing with $\frac{1}{2}$ grain and increasing by $\frac{1}{2}$ grain each time till $2\frac{1}{2}$ grains were reached, a total of $17\frac{1}{2}$ grains in all being given. The patient bore these very well without ill effects, but the injections had no effect upon the infection at all, the adult worms not being killed and continuing to pour embryos into the blood as before. The embryos were not all killed, as, even though reduced in numbers, as on the night after the injections, those present were alive and healthy.

The only feature worthy of note is that at first there were fewer embryos in the sample of blood taken on the night of the injections, which were given at 4 P. M. This is not surprising when one considers that they would be in the lungs at that time and that the antimony would come in direct contact with them in a concentrated solution. That there was no effect upon the adults is shown by the numbers being up to normal the next evening and afterward. Further, toward the end of the injections, even although the large dose of $2\frac{1}{2}$ grains was being given, this temporary disappearance was no longer noticeable, the number found on the same evening as the injections being up to the average, or even a little above. If the female worms constantly pour young into the blood, then there must be a corresponding destruction going on to keep the numbers at this mean

rate. Possibly on the days when over 20 embryos per slide were found there may have been an increased outpouring from the female; or, of course, there may have been several females present giving birth to embryos intermittently.

It would appear, therefore, that antimony is not to prove a specific for filariasis as it is for bilharzial infections, but the only way finally to decide this point is to follow up cases, as Low and Gregg have done, all results being checked by careful enumerations of the embryos.

The Origin and Prevention of Inter-peritoneal Adhesions.

BEHAN, in the *American Journal of the Medical Sciences* for September, 1920, states that he has used lanolin and boric acid (5 per cent) in over three hundred abdominal sections and has noted no bad results from its use. In fact, patients after its use claim they have very little pain, and those who have had a previous abdominal section and are able to compare their sensations with those experienced after the previous operation are always pleased with the greatly lessened pain which they experienced when lanolin and boric acid had been used. For this reason, i.e., the relief of pain alone, the use of lanolin and boric acid is justified. It certainly produces greater ease in the very severe operative patients. He finds it very beneficial in those patients who have developed adhesions around the cecum and ascending colon, either from a chronic appendicitis or as the result of some congenital defect by which stasis is present in the colon, and has resulted in a perityphlitis and pericolonic adhesive formation. In such patients he uses it very liberally and has had uniformly good results. He has also used it in several cases of recurring interperitoneal adhesions with gratifying absence of the former symptoms.

The presence of adhesions between the omentum and adjacent viscera or the omentum and the abdominal wall, where a previous operation has been done, is also a

suitable indication for the use of lanolin and boric acid.

In using lanolin and boric acid, however, precaution must be taken that the lanolin secured is as nearly pure as possible. Most of the lanolin on the market is contaminated in various ways, and frequently its interperitoneal use causes a very marked reaction—i.e., an elevation of temperature and of pulse. It should also be sterilized three times on three different days, each time for a half-hour at a temperature of over 212°. Before being used it should be heated so that it is absolutely fluid; in fact, it should be applied very hot to the peritoneal surface. In this way it dries out the moisture of the peritoneum and at the same time sticks very firmly to it. It should not be applied upon a moist surface. The bowel should be dry before its application.

Behan has also used lanolin and boric acid rather successfully in tendon implantation and transference, also in cases in which it was necessary to liberate tendons from adjacent structures, the adhesions being due either to traumatism or to tenosynovitis.

He has been using this preparation for the last five years. He is very well satisfied with it, and feels that it does a great deal of good.

Lanolin and boric acid paste, of course, have their limitations. In the presence of inflammation it does not act. This is a valuable quality, because if it did inhibit adhesions, in cases of peritoneal inflammation, its use would be very dangerous. Adhesions are the life-saving structures in inflammation of the peritoneum. Another fact of importance to be remembered is that lanolin and boric acid paste does not absolutely inhibit adhesions between two adjacent surfaces, which are denuded of their serosa and are held in contact. Therefore, it should be the attempt of the surgeon to see that no two surfaces denuded of serosa come into and remain in permanent contact. The viscera at the close of an intra-abdominal operation should be so arranged, if possible, that long contact cannot

happen, and, as a further precaution, the position of the patient should be such after operation that involved peritoneal surfaces will have a tendency to gravitate away from each other; for this reason also the position of the patient should be frequently changed. Drugs which have an active peristaltic action, either strychnine or eserine salicylate, should be exhibited in quantities sufficient to produce active peristalsis. Magnesium sulphate is also a very good drug, useful for this purpose. Any cathartic, stimulating intestinal peristalsis, may be exhibited with profit.

As a further aid to peristalsis, where there is no danger of spreading an inflammation, he applies heat to the abdomen in the form of hot-water bottles, electric pads, etc., which are very beneficial in sluggish peristalsis. Diathermia is one of the most recent but perhaps one of the best means of stimulating peristalsis after operation.

Arterial Hypertension and Benzyl Benzoate.

MUSSER, in the *New York Medical Journal* of October 16, 1920, states it has been shown conclusively that drugs are of little value in combating high pressure over any length of time. The iodides are of value only in syphilitic cases. The nitrites produce a temporary fall in pressure only, and a tolerance to them quickly follows their prolonged use. They should be reserved for emergencies. Radium-charged water has not been followed by any particular action, as far as he can determine in the few cases in which he has employed it. Of the newer drugs benzyl benzoate has received particular attention as a reducer of blood-pressure. This drug was introduced by Macht in 1918 and came into general use in the fall of 1919. He discovered that this preparation has a marked relaxing action on the unstriated muscles of the body and is capable of relieving spasm of such muscle. On account of this antispasmodic and tonus-lowering effect Macht had the drug tried out in a variety of conditions

which are associated with muscular spasm. He asserts that he received good results in relieving the following spasmodic conditions: Diarrhea and dysentery, biliary colic, ureteral colic, vesical spasm, spasmodic pains in seminal vesicles, uterine colic, bronchial asthma, and arterial spasm hypertension.

It is with this last condition that he is particularly interested to-day, and he recounts his rather brief experience. In a small series of six cases he religiously gave the drug for some weeks. In order to test it out he used but few auxiliary methods, but rather made an effort to see if the benzyl benzoate, plus a few simple general hygienic directions, would lower the pressure. In no case did he see any effect from it whatsoever. Likewise, he has talked with some of his colleagues and they have been almost unanimous in expressing the opinion that it has but little effect on the blood-pressure.

While he has seen little if any result from the administration of benzyl benzoate in the treatment of increased blood-pressure, he has had the opportunity of testing it in two cases of angina pectoris and can testify as to its value in this condition. Likewise in several other painful or disagreeable spastic conditions its action has been truly remarkable.

High Blood-pressure.

BARKER, in the *Ohio State Medical Journal* for October, 1920, states that drugs have their place in the treatment of chronic arterial hypertension, but it is a less important place than was formerly supposed.

If there be constipation it should be overcome, mainly by diet, exercise, and habit formation, but mineral oil and gentle laxatives at night, or morning salines, may sometimes be required as adjuvants. Many hypertensives feel better for a weekly or a fortnightly purge (blue mass and compound extract of colocynth at night, followed by a saline the next morning).

The iodides were formerly given almost as a routine measure to patients with high blood-pressure. Now that we know that the underlying process is not due to syphilis, the iodide treatment has gone out of fashion. Some patients with hypertension undoubtedly feel better when they take iodides. Why, we do not know, though it has been suggested that a decrease in the viscosity of the blood is responsible. Hypertensive patients who also have hyperthyroidism usually feel worse when they take iodides. The severe headaches from which some hypertensives suffer are, as a rule, aggravated by the exhibition of iodides.

The nitrites, too, are used much less than formerly in hypertension. Nitroglycerin, and sodium nitrite, will reduce the blood-pressure temporarily, but without advantage to the patient except in cases of angina pectoris, or in those in which cerebral apoplexy is threatened.

There are many reports in the literature of blood-pressure reduction from the use of radium emanation or of intravenous injection of soluble radium salt. Further studies must be awaited before judgment may safely be passed upon this form of treatment.

One drug is worthy of much more extensive and more intelligent use in hypertensive cases than is common. He refers to digitalis. Not only is it of great value when the heart muscle has evidently begun to flag, but it may be given in moderate dosage earlier with advantage. The circulation improves, renal elimination is favored, and the blood-pressure, both maximal and minimal, may sometimes show a lower range. In a case in which the blood-pressure has fallen from enfeeblement of the myocardium, with or without "mitralization" of the heart, digitalis may restore the blood-pressure to its previous high level with both subjective and objective improvement of the patient.

In the early stages of arterial hypertension, it is desirable to remove all definite foci of infection that are discoverable in

the hope that, by cutting off chronic bacterial intoxication, something may be done toward arresting the progress of the underlying process. Thus definitely infected tonsils, paranasal sinuses, or teeth, chronic cholecystitis, chronic appendicitis, chronic prostatitis, and other local infections, should receive due surgical attention if they be found to exist.

In the later stages of the disease, however, when extensive damage to the kidneys, to the heart, or to the blood-vessels has already been done, care should be taken not to subject the patient to unnecessary surgical risk, and much judgment is needed to discriminate between the cases in which benefit may reasonably be expected to follow surgical interference and those in which its dangers outweigh the prospective benefits.

Undoubtedly it may sometimes become necessary to operate upon a patient with advanced cardiovascular-renal lesions, for example, in strangulated hernia, in prostatic obstruction, in empyema, or in severe chronic infection of the biliary tract. He has been surprised to find how well, in such cases of surgical urgency, patients with high blood-pressure and its congeners bear anesthesia and surgical trauma, especially if it be possible to prepare the patient during a short period before the operation by rest, by diet, and by appropriate measures for strengthening the myocardium, and for detoxicating the body by increasing elimination through the kidneys and the bowel.

One minor surgical procedure is worthy of especial mention for the treatment of hypertensive patients, namely, the withdrawal of from 300 to 500 Cc. of blood from a vein. The bloodletting of our ancestors certainly has its place in the treatment of patients with high blood-pressure; most of the advanced cases, especially the plethoric and the obese, are the better for the loss (by needle) of half a liter of venous blood at intervals. Nature herself sometimes applies this method for us in the

form of an occasional spontaneous and profuse epistaxis.

Barker is often asked whether or not the operation of splitting the capsules of the kidneys (Edebohl's operation) is advisable in the contraction of the kidneys associated with chronic arterial hypertension. In his experience it has been of no benefit in this form of chronic renal disease.

Any full account of the therapy of the various complications that threaten life, as the end of this high blood-pressure process is approached, would of itself require a long paper. In summary, however, Barker reminds us of the principal measures that may be used. Thus:

1. In complicating myocardial insufficiency, physical and mental rest, a few days of Karell diet, followed by "cardiac diet," consisting of five small meals a day rather than three large ones, massage, morning saline and evening sedative, and the use of digitalis or strophanthus.

2. In complicating angina pectoris, avoidance of the things that bring on the pain, careful regulation of the diet and of the emunctories, prohibition of the use of tobacco, and systematic administration of nitroglycerin or of other nitrites both in and between attacks.

3. In complicating pulmonary edema, hypodermic injections of morphine and atropine.

4. In complicating "cardiac asthma," morphine, nitrites, and digitalis.

5. In complicating cerebral apoplexy, derivatives, ice-cap to the head, and rest.

6. In complicating uremia: (a) protection of the kidney (by diet and vicarious elimination by means of mild purgation, diaphoresis, and bloodletting); (b) support of the heart (by rest and cardiotonic measures); (c) symptomatic treatment of the nervous, digestive and cutaneous manifestations; and

7. In complicating infections, immediate rest in bed, good nursing, protection of the kidneys, support of the heart, and, in addition, special measures directed toward the

local or general treatment of the infection itself.

In these end-stages the physician can do much to ward off an impending danger, to mitigate suffering, and to solace patient and friends. But both physician and patient do best at the very end of the hypertensive process to face reality with courage, to avoid doing too much, and especially to prevent undisciplined, wishful thinking from inaugurating a busy and meddlesome therapy that not only does the patient no good, but brings torture to him in those last hours that might reasonably be made euthanasic.

Reinfection and Curability of Syphilis.

JACOBI in the *Archives of Dermatology and Syphilology* for October, 1920, summarizes his conclusions as follows:

1. The question, "Is syphilis curable?" cannot be answered definitely in the light of our present knowledge.
2. The occurrence of reinfection in syphilis may be accepted as an established fact.
3. Reinfection, however, is by no means evidence of curability. These two conceptions do not stand and fall together, as many believe; they are not contingent on each other, and should be dissociated in the interest of clear thinking and unbiased judgment.

Treatment of Generalized Psoriasis.

MOOK, in the *Archives of Dermatology and Syphilology* for October, 1920, states that in the treatment of the body two ointments are necessary—one to prevent as much as possible and relieve the chrysarobin dermatitis. First, a soothing application is used: 1-per-cent ichthyol (or a substitute), corn-starch and zinc oxide, 6 per cent, each, in white petrolatum. This is to be applied to the normal skin between patches before the chrysarobin ointment is applied. It is also to be used after chrysarobin dermatitis has developed. Second, a chrysaro-

bin ointment, which consists of 2-per-cent phenol and 10-per-cent chrysarobin in white petrolatum, is applied. These amounts will be advantageous in a majority of cases, but may be decreased or increased when advisable. The patient should be warned of the danger of conjunctivitis from chrysarobin and instructions given to prevent its occurrence.

After the ichthyol or soothing ointment has been applied to the normal skin between the lesions, preferably with a wooden tongue depressor or spatula, the chrysarobin ointment is applied to the lesions with a swab made of cotton or gauze twisted on the end of a stick. Stiff brushes are to be avoided as too irritating. Corn-starch or talcum powder is then dusted plentifully over the entire body and the patient advised to abstain from walking or exercising as much as possible, though it is not necessary to remain in bed. Bandaging the extremities is not necessary and causes discomfort. A large armchair in the room will add to comfort.

Applications are made once daily until the chrysarobin dermatitis begins to develop, and it is at this point that the greatest skill in the treatment must be manifested. The chrysarobin must be discontinued if severe reaction develops. An occasional corn-starch and soda bath may be advisable as a rest and for cleansing purposes, using two cups of starch and one cup of baking soda to the bathtubful of warm (not hot) water.

The skin will be discolored after the first treatment, and after three to six days the skin generally becomes much reddened, but with less real inflammation than is usual when chrysarobin alone is used. The ointment is not to be discontinued unless the distress from burning and pruritus is unbearable. If the chrysarobin must be discontinued for a few days, the soothing salve is applied twice daily until it may be resumed. In some patients the chrysarobin may be applied continuously until all lesions have disappeared. In a few, two applications daily are possible, but in a majority

rest is indicated after five or six days. Occasionally persons with idiosyncrasy will be encountered, and in these the method is useless.

The objections to the method are many and individual skill must be developed. Certainly it is a dangerous weapon for the unskilled. The confinement to a room or hospital, the destruction of a certain amount of clothing, and the physical discomforts that may be encountered are obvious, but when necessity or desire demands a rapid removal of lesions with a favorable assurance of success, the writer can heartily recommend it.

A Menace in the Low Protein Diet in Skin Diseases.

MICHAEL, in the *Archives of Dermatology and Syphilology* for October, 1920, states, in concluding his article on this subject:

1. Most patients, on a low protein diet, receive an increased carbohydrate ration.
2. A diet rich in carbohydrates is contraindicated in patients who present a pre-diabetic condition.
3. Patients who have psoriasis or other dermatoses, in which a low protein diet is often resorted to, may also be prediabetics.
4. Therefore, before a special diet, low in protein and rich in carbohydrates, is instituted, the sugar tolerance of the patient should be ascertained.

Lactic Acid Milk.

In the *Journal of the American Medical Association* of October 2, 1920, SHERMAN and LOHNES state that they have worked out a method for the use of lactic acid milk which is very simple.

It is well known that the fermentation of lactic acid milks continues up to a certain point of fermentation—that is, of acidity. At about 60, as measured by decinormal sodium hydroxide solution, spontaneous fine clotting occurs. At about 170 to 190

the acidity destroys or renders inactive the fermenting bacillus, and the process consequently of itself ceases.

They have taken the milk, either skimmed or whole, and in the morning added the ferment (1 ounce of ferment to 31 ounces of milk) and stood them away in a warm place till a convenient time the next morning. Knowing by numerous tests that the acidity has reached about 170 to 190 by that time, they dilute the skimmed or whole lactic acid milk with an equal amount of skimmed or whole sweet milk that has been boiled, and then have the desired acidity of from 75 to 95. Because the acidity is above 60, there occurs a spontaneous fine clotting of the added sweet milks with a resulting homogeneous, smooth, clotted mixture. This mixture of lactic acid and sweet milks is then boiled or not, as we desire. It is then further modified, as the case demands, and put away on the ice. It keeps nicely, changing very little in the following twenty-four hours, the change being much less if boiled a second time.

This is a simple method, which can be carried out even in the household of the ignorant. It requires merely the making of a certain amount of whole or skimmed lactic acid milk, to which can be added an equal amount, or more, of whole or skimmed boiled sweet milk. The small clots, which are formed during the process of fermentation, are flocculent in character and are very easily digested. Should the infant reject the lactic acid milk of correct acidity, the curds are small and soft, and show evidence of prompt digestion. To supply the carbohydrate needs they have added corn syrup; first, because of its contained variety of sugars, and secondly, because it is cheap. They have had cultures taken of an unopened can, and have found it germ-free.

Their series of cases tested on lactic acid milks has amounted to only about twenty-five. Given a mixture of the proper acidity, they find the infants very quickly seem to like it, and furthermore, those with rebellious stomachs retain it nicely. The effect

on the stools is marked and quickly obtained. The foul, putrefactive odor, so common in this class of hospital case, promptly ceases, and the stools become even, smooth, and of good color.

The infants seem rapidly to become less toxic, as is shown by the disappearance of various signs and symptoms:

Their appetites improve, and they take the formula well and are likely to retain it.

They soon lose their ashy-gray color. Their mucous membrane, especially of the lips, shows a decided betterment in color. This occurs before the gain in weight has been marked.

Their temperature becomes more stable, and an early monothermia occurs.

They soon become less fretful—in other words, are more happy.

Their sugar tolerance seems less easily broken, and gas formation is less likely to complicate the condition.

The loss of weight, or stationary weight, is soon likely to be overcome by a substantial weekly gain, and caloric feeding seems easier to reach.

The age of the infant seems to make very little difference with lactic acid milks. Finkelstein does not advise protein milk before three months of age, though this rule is not inflexible. But they have used lactic acid milks in the very young with as good results as with older infants. As an example, one of their patients was a premature infant of seven months' gestation, weighing 4 pounds at birth. At the end of its first month it weighed 5 pounds. It was started on its second day of age with a one-half skimmed lactic acid milk. This was gradually raised to a two-thirds mixture of lactic acid milk, which was made of one-half skimmed lactic acid milk and one-half whole lactic acid milk. This is approximately a 2-per-cent fat mixture.

The therapeutic effects of lactic acid milk or buttermilk are too often only superficially understood. The curds formed from it are small and easily cared for. The acidity seems to stimulate both the gastric

and the intestinal function, and the sterilization of the protein fermentation of the intestinal canal is marked. This change of intestinal state markedly lessens the absorption of toxic products, and the whole process of metabolism is hence beneficially affected.

Therapeutics of Thick Cereals in Disorders of Infancy.

In *Northwest Medicine* for October, 1920, DURAND reminds us that there are many breast-feeding cases which give us considerable trouble. First of all there are the babies with colic. Some of these are fat and over-nourished. Some are much under weight and gain poorly.

Current, of Spokane, says that colic cases are promptly relieved if given one ounce of 3-per-cent barley water before nursings. The marked effect on peristalsis noted in giving thick cereals in his pyloric obstruction cases and the similar effect of starch enemas in quieting peristalsis in the large bowel in diarrhea, with relief of griping pains and tenesmus, made this sound rational. Accordingly he has used the barley water in the overnourished colic cases and the thick barley mixture in the undernourished babies. The relief from pain has been very gratifying in the majority of cases. He is convinced that it offers a remedy much more rational and more effective than catnip and fennel, soda, peppermint, asafetida, or any one of the thousand and one remedies for colic. In the cases which are not gaining the results with the thick barley jelly have been surprising.

He reports the instance of twin babies, a boy and girl, three weeks premature. They were five weeks of age. Both were regurgitating some of the food, crying a great deal, bowels constipated. They were being nursed at three-hour intervals. The weight at birth was 4 pounds 12 ounces. Weight at examination: girl 5 pounds 1 ounce; boy 5 pounds. Barley jelly, one teaspoonful, was ordered before three feed-

ings daily and a four-hour feeding interval instituted. One week later each baby gained 11 ounces. The stools were normal. The mother said they seemed comfortable and now cried very little.

The result in these cases was particularly brilliant, but in most of the cases in which he has used the barley jelly to supplement mother's milk it has acted as a stimulus to rapid growth. In some of the cases he has made up barley mixtures with part milk, and in some cases used dextrimaltose in place of cane-sugar.

To summarize: Thick cereal mixtures, whether made from farina, rice, or barley water, may safely be given in amounts of one to four tablespoonfuls at a feeding.

They are better retained than liquid feedings.

They check peristalsis and pass through the duodenum in pyloric obstruction cases better than fluids.

His results, as well as those of Porter and Sauer, indicate that they should be given a trial before operation is advised.

Thick cereal mixtures are of service in neurotic vomiting, certain types of malnutrition, and particularly valuable to supplement breast feedings.

The cereal mixtures, because of their action in allaying excessive peristalsis, are the most effective remedy we have for the treatment of colic in infancy.

The Effect of Mercury Salicylate on the Wassermann Reaction.

SUTTON, in a letter to the editor of the *Archives of Dermatology and Syphilology* (October, 1920), in referring to a previous article by Goodman on this subject, says:

"I thought all syphilologists were past that mile-post of knowledge which marks the use of liquid petrolatum as a vehicle for intramuscular injections. It has repeatedly been shown that the material is not absorbed, and that about all the physician gets is a paraffinoma for his pains.

"I think Goodman also erred in the mat-

ter of dosage. Few of us would expect to secure permanently beneficial results following one-grain doses of mercury salicylate, injected at intervals of one week, even if an absorbable medium were used.

"I have been employing mercury salicylate, in an olive oil and lanolin emulsion, for more than twelve years, and while I occasionally branch off and try some other highly recommended preparation, I have invariably returned to the old standby, for I am convinced that when properly employed it is one of our most potent and reliable remedies in combating syphilis."

The Corpus Luteum Treatment of Hyperthyroidism.

HOPPE, in the *Ohio State Medical Journal* for October, 1920, states that he has been using the corpus luteum now for six years. He was impelled to try it at first in a very acute case of Graves's disease because of the presence of amenorrhea which had persisted for a year. This patient had had prolonged rest and the usual medicinal remedies, but went from bad to worse. She had lost sixty pounds in weight. She made a complete recovery and has remained well for the past five years. Since his last report in 1918 he has treated twenty-five additional cases, and has occasionally seen most of the cases reported previously.

None of his fifty cases were doubtful ones. In making the clinical diagnosis of hyperthyroidism, he has established for himself the rule that if there is no bruit in the thyroid gland he does not make the positive diagnosis of hyperthyroidism and places the case in a doubtful category. All of his cases were diagnosed as positive. One of them, reported in 1917, died of influenza; all the others are doing well, and some of them seem to have established a normal balance of the endocrine glands and do not take corpus luteum. The others are comfortable when they take corpus luteum.

He has had no cases of hyperthyroidism

operated on since 1917. In the last group of twenty-five cases one man died twenty-four hours after he had seen him in consultation. The patient had had hyperthyroidism for years—was in an acute relapse at the time of the consultation, and was suffering from and died of acute myocardial disease leading to cardiac dilatation. Three or four of these cases were very acute—one had lost sixty pounds and the other seventy pounds; both of these latter cases have made practically a complete physiological recovery and have taken up their former occupations. Both were women. Both had extreme cardiovascular symptoms, exophthalmos, diarrhea, and rapid emaciation. One, the wife of a physician, has made a perfect recovery; the other has still some exophthalmos and an enlarged thyroid, but insists that she is well, and has worked in a factory for the past year. This second group contains a surgical case which had the thyroid removed, but still presented all the objective signs and subjective distress of hyperthyroidism. She has improved under the treatment. Three of the other cases are very much improved; all of them are satisfied and relieved. In the latter group of cases there is but one male, and he has done well on extract of pituitary gland.

The most notable and the most rapid improvement is seen in those showing cardiovascular symptoms and general nervous manifestations. The pulse-rate drops quickly, the general subjective symptoms caused by the circulatory disturbances subside, the loss of weight stops, digestion and appetite become normal, the nutrition improves, and the patient takes on weight.

While Hoppe looks upon the corpus luteum as the specific agent in the treatment of Graves's disease, he has not discontinued the symptomatic treatment, nor the attention to hygiene and diet, for after Graves's disease has been established we see general signs of pluriglandular disturbance. The digestive disturbances, the increased metabolism, and the rapid emaci-

ation all demand symptomatic treatment. On account of the general nervous and mental irritability, cases of Graves's disease are not very easily managed, nor are they as a rule faithful to the treatment. He gives careful attention to the diet, allows very little physical exercise, and prescribes much rest in bed. Quinine hydrobromate and extract of belladonna are of great value. He usually gives two grains of corpus extract, three grains of hydrobromate of quinine, and one-tenth grain of the extract of belladonna after each meal. After the cases show improvement he diminishes the dose to two per day, and even when the patients are apparently well he still gives one dose per day, usually at bedtime. As in a previous report, he finds that patients who take the treatment irregularly or who discontinue the treatment show a tendency to relapse and to have an exacerbation of all symptoms. He believes that the exacerbations and remissions which are ordinarily seen in Graves's disease are due to the fact that defective ovaries may occasionally produce even several months in succession normal corpus luteum, and during these periods the patient shows an improvement. He believes that in the cases which have recovered, the use of the corpus luteum has tided the patient over and assisted her in establishing a compensatory secretion by one of the other endocrine glands, thereby bringing about once more an endocrine balance with a permanent relief of all the symptoms.

The theory on which the above treatment is based, therefore, is that hyperthyroidism is caused by a defective secretion of the interstitial sex glands; that the hormones of the interstitial sex glands have an inhibitory and regulatory action on the secretion of the thyroid; that when the function of these interstitial glands is deficient, there is a lack of physiological inhibition of the thyroid, with an excessive secretion and, therefore, hyperthyroidism. In other words, hyperthyroidism and hypo-ovarianism are synonymous conditions.

As he has said before, the mere administration of corpus luteum alone will not relieve these cases. Even a superficial knowledge of Graves's disease would disabuse our minds of this idea. The cases require careful dietetic, hygienic, and symptomatic treatment. But whereas his previous experience has been that most cases with the above symptomatic treatment combined with quinine hydrobromate and extract of belladonna showed but indifferent results, the use of corpus luteum, in conjunction with this general treatment, gave most satisfactory results.

The treatment of hyperthyroidism with corpus luteum is comparable with the treatment of myxedema with thyroid extract. As long as we administer thyroid extract, cases of myxedema and hyperthyroidism do very well. But the administration of thyroid extract will not make a defective thyroid resume a normal function. Nor will the administration of corpus luteum cause a deficient ovary to produce a mature Graafian follicle. But it has been Hoppe's experience that, as long as we administer corpus luteum in Graves's disease or in its period of exacerbation, the patient is improved and can be kept in a fairly normal condition.

Ocular Accidents Attributed to Arsenical Products.

The *New York Medical Journal* of October 2, 1920, writing editorially on this subject, points out that the arsenical compounds, both mineral and organic, have been the cause of various accidents, but ocular disturbances attributed to these products are the most serious of all. The arsenical products that have produced slight ocular accidents having a good prognosis are the cacodylates and sodium and potassium arsenate; those producing serious disturbances are atoxyl, arsacetine, hectine, and hectargyre, as well as salvarsan and neosalvarsan.

Regardless of the very extensive use

made in recent years of the cacodylates, lesions of the optic nerve have never been recorded. The few cases reported of optic neuritis following the internal exhibition of sodium or potassium arsenate have been neuritides presenting the type of toxic neuritis or infectious neuritis with a central scotoma, without any change in the peripheral visual field but offering a slight irregularity in the outline of the papilla. The prognosis is favorable in these cases.

Atoxyl produces complete and incurable atrophy of the optic nerve following a retrobulbar neuritis, the symptoms being a narrowed visual field, decrease of the pupil reflex, white papillæ, and a narrowing of the vessels of the retina. Arsacetine acts in the same way, only its toxicity is somewhat less. Hectine and hectargyre produce identical lesions of the optic nerve, but nevertheless not so serious as those resulting from atoxyl.

However, all things considered, ocular complications have been reported too frequently from these products, so that preference should be given to salvarsan, arsenobenzol, or neosalvarsan. The ocular accidents attributed to salvarsan may be placed in three categories, namely, accidents in the uveal tract, those of the optic nerve, and accidents arising in the motor nerves, the globe of the eye, and the eyelids.

The accidents arising in the uveal tract—iritis and choroiditis—attributed to salvarsan are, in reality, merely syphilitic manifestations and are not the result of the drug. Their early appearance is proof of this. Likewise, the optic neuritis attributed to salvarsan would seem also to be of a syphilitic nature; it is neither more frequent in occurrence nor earlier in appearance than before salvarsan came into use.

As to the disturbances of the motor nerves of the eye, they are simply manifestations of the syphilitic virus and cannot be attributed to salvarsan. The cases recorded by Bizard, Sicard, Guttmann, and others were due to meningeal phenomena

which reacted upon the cranial nerves, as might be expected; these meningeal phenomena were noted at the very onset of the syphilis and before treatment with salvarsan had been given.

It is also safe to assume that what has been said of salvarsan applies as well to neosalvarsan, arsenobenzol, and other recent products of arsenic, and that with very small doses repeated daily or every second day, either subcutaneously or intravenously, no accidents of any description need be feared.

Blood Matching as a Routine in Pregnant Patients.

In the *Boston Medical and Surgical Journal* of October 7, 1920, TITUS states that the trend in obstetrics, as in all other branches of medicine and surgery, is toward prevention. We examine routinely thousands of specimens of urine for the occasional one containing albumin; we take many routine blood-pressures, watching for the important rise; we do careful physical examination to rule out the infrequent patient unfit to have babies; we examine many pelves to find the unusual one which contains some pelvic obstruction to safe delivery; we do many Wassermanns for the one that proves positive—all this to find the occasional patient who is in one sense or another obstetrically abnormal. That very few abnormal patients are so found is no argument against trying to find them. All this routine is essential if obstetrical disasters are to be avoided. The ideal of obstetrics is not reached until we have done all that can be done to safeguard our patients against any and all disasters.

The accidental bleeding cases are the ones which by no examination can be anticipated. Detached placentas will occur, placenta previas give warning only when they bleed, postpartum hemorrhages will come when least expected. For all loss of blood there is nothing like replacing blood, and severe shock is best treated by blood

transfusion. Time spent in getting ready for safe transfusion in hemorrhage or shock patients is time lost. The technique of blood transfusion has been so perfected that it is known to be unsafe to give blood to any one unless the blood of the donor and the blood of the recipient have been matched and found compatible. Occasional instances of incompatibility have been observed in the matching of bloods of people in the same group. Every one who is in group four is a potentially safe donor, but even though the person be in group four it is clinically unsafe to transfuse with that person's blood until his blood has been matched with the blood of the person to whom it is to be given; and all this takes a certain amount of time—time which may be very, very precious, and time which may be entirely saved. It is a perfectly simple matter to match the blood of the pregnant patient with her husband's or with some person's in group four, any time within the last month or six weeks of expected delivery. Matching blood means only a few minutes if one is prepared to do it, and if one has a safe donor at hand when the need of transfusion arises much time otherwise spent in getting a donor can be saved.

For some time it has been the custom of Titus to match the bloods of his patients with the blood of the husband and with the blood of a group four person. This has been done within six or eight weeks of expected delivery. Telling the patients of the very extraordinary condition that so rarely occurs to warrant this procedure meets with their full approval. Strangely enough only one of the husbands whose blood he has matched with the wife's has been compatible; on the other hand, the group four person has been compatible with the pregnant patient's blood in every instance. One hears occasionally of patients who have died because of hemorrhage, when the time spent in getting ready for the transfusion was too long. If one of these patients can be saved by the simple routine procedure of blood matching the

habit is well worth while. One such disaster is enough to warrant this routine on many, many patients. Such routine, of course, is not practicable in clinics taking care of patients at home. So far as hospital practice goes, all patients arriving who have had any hemorrhage and cases in which the possibility of hemorrhage is present should be matched in order to meet the emergency if it should arise. Among men doing obstetrics and obstetrics alone any procedure which tends to lessen the dangers of delivery for their patients certainly is worthy of consideration. It is upon this basis that blood matching as a routine is advocated.

The Prevention of Diabetes Mellitus.

WILLIAMSON, in the *London Practitioner* for October, 1920, states that from what we know of the etiology of diabetes the following recommendations appeared justified with a view to postponing the onset of the disease, or possibly preventing it:

1. It is desirable for all, even for those who are in good health and have no grounds for fearing diabetes, to avoid great excess of sugar, jam, sweets, chocolates, sweet foods, and sweet drinks.

2. If, through family history of diabetes, race tendency to the disease, or on other grounds, the onset of diabetes is feared, but sugar has never been detected in the urine, then the following precautions appear advisable:

The amount of sugar in the diet should be restricted.

Sugar should not be added to any food or drink. Coffee and tea, puddings, etc., should all be taken without sugar. All very sweet food, very sweet fruits, and very sweet drinks, and all articles containing much sugar, should be generally avoided (such as honey, syrup, treacle, dried sweet fruits, figs, dates, raisins, currants, prunes, jams, marmalade, chocolates, and sweets of all kinds; sweet drinks such as port, tokay, champagne, and other sweet wines;

whisky and sugar, gin and sugar, herb-beer, liqueurs, fruit juices and syrups, cocktails, gin, and ginger beer). Sweet lemonade and cider should be taken only in small amount.

Excess of alcohol should be carefully avoided, especially excess of beer and alcoholic beverages containing much sugar. Excess of alcohol probably increases the risk of diabetes in certain cases. Foods or drinks containing only small quantities of sugar may be safely taken by this class of cases. Starchy food and starch carbohydrates may be taken in the usual quantities.

Excess of food should be avoided, since this is probably a predisposing cause in some cases.

If very large quantities of food have been taken and difficulty is experienced in restricting the amount, then foods like green vegetables and jelly, which contain little absorbable foodstuffs in the large bulk consumed, may be recommended to be taken freely. A tendency to obesity should be checked, if possible, since the mild form of diabetes is often preceded by obesity.

It is probably better to take the daily ration in frequent small meals, since sugar is better destroyed if slowly absorbed.

Sufficient physical exercise is very important.

Excessive brain-work and severe brain-strain should be avoided, if possible.

The Effect of Salt Ingestion on Cerebrospinal Fluid Pressure and Brain Volume.

In the *American Journal of Physiology* for October, 1920, FOLEY and PUTNAM remind us that Weed and McKibben demonstrated that it is possible to reduce the cerebrospinal fluid pressure and diminish the bulk of the brain by injecting hypertonic solutions into the blood stream. Conversely, they showed that the pressure and the bulk of the brain could be increased by the injection of hypotonic solutions. Their

work has been repeated and their general conclusions confirmed.

These authors have shown that the introduction of hypertonic salt solutions into the gastrointestinal tract has a similar effect. This route of administration is more convenient, and by its use the disturbances of circulation and respiration common with intravenous infusions are avoided.

Twenty to thirty cubic centimeters of a 30-per-cent sodium chloride solution introduced into the duodenum or rectum of an average sized cat produced a maximal fall of cerebrospinal fluid pressure. Following such doses the average fall of pressure in a large series of experiments was 258 mm. of water. Larger doses added nothing to the extent of the fall. A dose of 5 Cc. produced a fall of 104 mm. of water, and intermediate doses gave roughly proportionate results. Following this fall in pressure there is a gradual rise. Thus, seventeen to forty-eight hours after such injections, four animals showed pressures averaging 45 mm. less than the average normal.

Sodium chloride solutions in only slightly hypertonic concentration are also effective in causing a fall in cerebrospinal fluid pressure, although to produce appreciable changes large doses are required. Doses of 40 to 150 Cc. of 2-per-cent sodium chloride solution caused falls of pressure averaging 97 mm. of water, in cats.

Saturated solutions of sodium sulphate, which is not absorbed from the gastrointestinal tract, produced qualitatively similar results, but less in extent and at a slower rate. With concentrated dextrose solutions the fall is still less and its rate still slower.

Water injected into the duodenum produces a small rise of pressure in the normal animal, but it disappears more rapidly than the fall incident to salt ingestion. If the animal has been given a concentrated saline solution the day before, the rise in pressure following the administration of water is more marked and of longer duration.

Such changes in cerebrospinal fluid pressure were shown to be independent of changes in arterial or venous blood-pressure.

These changes of fluid pressure are accompanied by a decrease in the size of the brain.

The manometer readings (pressure values) obtained after salt ingestion are not due solely to changes in brain volume and capacity of the cerebrospinal fluid spaces, but primarily represent new ratios between secretion and absorption of cerebrospinal fluid.

An Improved Method in the Treatment of Otitis Externa.

PRENN, in the *Boston Medical and Surgical Journal* of October 14, 1920, states that although we classify this condition as furunculosis on account of its etiology, clinically it presents a different picture and runs an entirely different course. We very seldom see here a furuncle coming to a head, unless in the superior part of the canal where the cartilage is wanting. There is no give to the skin of the canal; it is strongly adherent.

Occasionally we meet with a cycle of infection as in other parts of the body. This is especially true in people with a furuncular diathesis. Various parts of the canal will be infected in consecutive order. Recently a case like this came under his care in a patient with furuncular diathesis whose canal went through the cycle of infection, starting with a furuncle superiorly that came to a head, and after the entire canal was healed the tragus of the same ear became infected. As a rule, however, the infection from the start is confined either to one part or, if severe or when it has taken place in different parts simultaneously, to the entire canal.

Subjectively the patient experiences pain, which is sometimes excruciating. He feels it especially when the condyle of the lower jaws bears pressure on the external canal,

as in eating. He cannot stand any pressure or traction of auricle at all, and of course cannot lie on the affected side. The patient experiences difficulty in hearing and complains of a sense of fulness and becomes irritable.

Objectively there are an infiltration and edema of varying degree to complete closure of canal. The drum membrane may become thickened and red, but not bulging, due to the extension to the outer layer of the drum membrane from the canal, and it clears up with the latter. By extension from the canal a postauricular abscess may form in children when the infection is posteriorly, or infection of parotid through the fissures of Santorini when the infection is anteriorly. There may be a cellulitis of the neck downward.

When the inflammation is slight, heat and medicinal applications may effect a cure. Various medicines are being used by different men, but solution aluminum subacetate properly prepared and properly and gently applied gives very good results. When pus is present he makes deep incisions to obtain pus. Twenty-four hours after the operation he inserts a gauze strip soaked in the above solution into the canal, and the patient keeps same moist with the solution by means of a medicine dropper. The dressing is changed daily for a few days. When there is marked edema, especially when the entire canal is involved, incisions are made on all sides of the canal under general anesthesia, followed by the application of heat and in twenty-four hours by the above solution.

The question of the kind of heat is important. Since the patient cannot stand any pressure, the difficulty of applying different poultices and holding them there is obvious. Especially difficult is it on lying down. He cannot lie with his sick ear on the poultice, neither can he stand the poultice resting on his ear. The poultice cools off readily, and that is another disadvantage. It is certainly uncomfortable, to say the least; it retards the healing, and it adds

a great deal to his already taxed nervous condition.

He therefore found the use of the electric bulbs 50-100 candle-power very beneficial. The patient can sit with the sick ear turned to the lamp, or lie on his good side with the lamp lowered from a flexible or folding stand with a shade over it bent right over his sick ear, and get the benefit of a uniform heat.

Effect of Tonsillectomy on the Recurrence of Acute Rheumatic Fever and Chorea.

ST. LAWRENCE, in the *Journal of the American Medical Association* of October 16, 1920, in summarizing his paper, states:

Eighty-five children, each of whom had presented one or several of the rheumatic manifestations before the tonsils were completely removed, were observed during an average period of three and one-half years after the operation was performed.

The tonsils were markedly hypertrophied in 13 per cent of the cases, moderately so in 69 per cent, and not enlarged in 18 per cent. They were the site of recurrent inflammation before the tonsils were removed in 73 per cent of the cases. "Sore throat" recurred after removal of the tonsils in 7 per cent of these. At least two operations were necessary before the tonsils were completely removed in 22 per cent of the cases.

The tonsillar lymph nodes were enlarged in 100 per cent of the cases before the operation was performed, while in 59 per cent they were impalpable afterward.

One or more attacks of acute rheumatic fever had occurred in forty-two cases before the tonsils were removed. After tonsillectomy there was no recurrence in thirty-five cases, or 84 per cent.

One or more attacks of chorea had occurred before the removal of the tonsils in forty cases, and there was no recurrence after the operation in twenty cases, or 50 per cent.

Sixty-one cases showed myositis and

bone or joint pains before the operation was performed, and there was no recurrence in forty-seven cases, or 77 per cent.

Fifty-eight cases of organic disease of the heart were present in the series. Twelve of these patients had suffered at least one attack of cardiac failure before the tonsils were removed. One patient suffered one attack afterward.

The exercise of tolerance in the cases of cardiac disease seemed to be favorably influenced by tonsillectomy in the instances in which indications existed for the removal of the tonsils.

Nutrition and general health were improved, and intercurrent disease was less common after the tonsils were removed.

Tonsillectomy (complete removal of the tonsils) would seem to be the most important measure at present available for the prevention of acute rheumatic fever and the allied rheumatic manifestations.

Sodium Biborate in the Treatment of Epilepsy in an Asylum.

MCCARTNEY, in the *British Medical Journal* of October 9, 1920, states that on the male side of the institution with which he is connected there are about 60 male epileptics. The majority are chronic cases, and a large number of them have been resident for many years.

Formerly the routine treatment was a large dose of potassium bromide (gr. xxx) night and morning. Examination of the ward books, in which a record is kept of all fits in epileptic patients, shows that this has had little effect in reducing the number of fits or bringing about any mental improvement. The only change noticeable was a lessening of excitability and an increase of mental confusion.

Sodium biborate is mentioned in medical text-books as an alternative to potassium bromide. Eight months ago he decided to try a mixture containing potassium bromide and sodium biborate. The treatment was commenced on December 27, 1919, on one

patient. The results were so striking in his case, after a fair trial, that it was decided to apply the treatment more widely. The benefit of the treatment has been very marked in all the wards; in two, where the treatment has been in use for four months, the fits have been reduced by 64 per cent, and in two other wards in which the treatment was tried about six weeks there was a reduction of 68 per cent, and this amongst patients who formerly had fits at regular intervals. It is interesting to note that four of the patients have had no fits since commencing treatment. Previous to treatment three of them never went longer than eight days without having fits, and the other averaged twelve days and then had a bout of from three to five fits.

The total number of patients in whom the above treatment has been tried so far is forty-two; in all there is a marked improvement in the mental state of the patients, and in all except one the number of fits has been reduced. In addition to the marked mental change and lessening of the fits, other points noticeable are the great reduction in the amount of sedative used and the marked diminution in the number of accidents which occur.

The Influence of Diuresis on the Elimination of Urea, Creatinine, and Chlorides.

In the *Journal of Pharmacology and Experimental Therapeutics* for October, 1920, MARSHALL states that the effect of the ingestion of large quantities of water (water diuresis) on the elimination of creatinine, urea, and chlorides has been studied in normal men and dogs. The urine volume is frequently increased twenty-fold or more; creatinine is not increased to a measurable extent; urea is increased definitely, but never more than twofold; chlorides are apparently increased, but the increase is variable and generally less marked than that of urea. The increases in urea and chloride do not correspond with the maxi-

mum increase in water excretion; in fact at the height of the diuresis the chloride elimination generally decreases. During water diuresis the chloride of the plasma may decrease, while the concentrations of urea and creatinine in the plasma do not vary appreciably.

The Treatment of Goitre with Radium.

CLAGETT, in the *Illinois Medical Journal* for October, 1920, asserts his belief that radium possesses the ability to kill a diseased cell or a new growth cell when five times the same dose would be necessary to kill a normal adult cell. Also when applied to a blood-vessel there is a swelling of the tunica intima followed by an obliterative endarteritis in the smaller vessels and diminution of the caliber of the larger ones. Now whether the toxic secretion be due to the additional blood supply or to the activity of the new-formed cells in the gland, or to both, it will be affected by the radium action. There is this further advantage in using radium, that while diffuse action over the entire gland will eliminate the toxic cells, yet the normal healthy tissue will be left untouched provided the dosage can be accurately estimated. Further, the blood supply will be reduced much more evenly throughout the gland than can be done by ligation of some of the thyroid arteries.

We also see that radium can be used not only in a case suitable for a surgeon, but in cases in which the surgeon is compelled to decline to operate, and even in cases in which the surgeon has operated and failed. The thymus and lymphatic system can be, and are, rayed, which may explain the success of radium in a case in which operative removal of a part of the thyroid has not been successful.

So far the literature shows no death resulting from radium therapy, and there is a marked advantage over the x -ray in that the dark discoloration of the neck following x -ray treatment has not been observed.

Radium can be used upon a nervous patient where the x -ray would be prone to cause excitement, and furthermore the radium can be carried to a patient at home.

The following is a summary of his own work. He has treated to date 47 cases of exophthalmic goitre with radium—the first case being treated in September, 1917. The patients' ages have varied from 16 to 74 years. Two were of the ages of 16 and 19, both with pronounced exophthalmic goitres. Of these cases six had already been operated on with recurrence of symptoms as bad or worse than before. Seventeen cases were declined as operable risks by some of the best surgeons. He has had to ray eight cases a second time as the dosage was inadequate, and while the patients improved, the first raying did not give sufficiently satisfactory results. Last October, in a paper read before the Radiological Society of North America, at Chicago, Claggett stated that one patient who had taken up Christian Science was apparently not benefited, but he is able to report that recently this patient's sister informed him that the patient is feeling entirely well and that she now ascribes her recovery to the radium treatment. Two cases with very bad broken compensation of the heart have died since treatment from acute dilatation, one three months after treatment, the other five and one-half months, though in both these cases the pulse had slowed an average of thirty beats and the nervous symptoms were remarkably reduced. In one case out of five there has been no reduction of the goitre; the circumference of the neck has diminished from three-fourths of an inch to three and a quarter inches in the others. One woman's goitre did not decrease until thirteen months had elapsed, and then suddenly went down one and five-eighths inches in less than two months.

The exophthalmos has usually been the last symptom to disappear and has remained in five of the cases. The pulse-beat has been reduced twenty to fifty beats. Nervous symptoms and tremors have dis-

appeared entirely and the patients gained in weight and general well-being. There has been symptomatic cure in all of the cases treated with the exceptions noted.

In concluding, he states his belief that radium should be given a trial in exophthalmic goitre for these reasons:

1. There is no mortality, no scar or pain, no long hospitalization. Three or four days suffice for the treatment.

2. Its advantages over the *x*-ray are: no discoloration of the neck, less time consumed in the treatment, simpler to apply.

3. The thymus gland can be treated.

4. While surgery in removing proliferating cells leaves others behind, and by ligating still leaves some of the blood supply more or less undisturbed, the selective action of the radium ray to a much greater degree destroys the harmful cells, while not disturbing the normal cells, and also causes a much more symmetrical diminution of the blood supply.

5. It can be used in cases in which surgery fears to venture or has failed.

6. Surgery has not been necessary after the radium treatments in a single one of his forty-seven cases, some of them extending back nearly three years.

Pyloric Stenosis in Infants.

SMITH, in *Northwest Medicine* for October, 1920, states that every case of persistent vomiting occurring in a young infant should be carefully investigated with the possibility of stenosis of the pylorus in mind.

In milder cases the possibility of spasmodic obstruction should be considered, and the relation of the vomiting to any existing nervous diathesis should be investigated. As in adults, gastrointestinal symptoms may have an origin outside the abdominal cavity. In this connection the unstable equilibrium of the infant's nervous organization should be lost sight of.

Improper food is not the only cause of vomiting. Sometimes the receptacle is de-

ranged physiologically, mechanically, or both.

Changes in an infant's food, especially if from mother's milk, should only be made for sufficient cause, with a rational idea of what is to be accomplished, and with an adequate appreciation of the responsibility undertaken.

No child should be allowed to die of starvation on account of pyloric stenosis. An operative death, even, indicates that an attempt was made to relieve the condition.

Quantitative Studies in Chemotherapy— The Oxidation of Arsphenamine.

VOEGLIN and SMITH, in the *Journal of Pharmacology and Experimental Therapeutics* for October, 1920, state:

1. The sodium salts of the following arsenicals are relatively very stable toward atmospheric oxygen: arsenious acid, methyl and ethyl arsenious oxide, phenyl and diphenylarsenious oxide, *p*-amino phenylarsenious oxide.

2. Arsphenamine (dihydrochloride), contrary to the prevalent views, is exceedingly stable toward atmospheric oxygen.

The addition of alkali leads to a rapid increase in the rate of oxidation of the compound, the rate of oxidation being roughly inversely proportionate to the hydroxyl ion concentration.

3. The sodium salt of arsphenamine is first oxidized to the corresponding oxide, and this compound is simultaneously oxidized to the pentavalent arsenical.

The relative concentration of unchanged arsphenamine and oxide depends on the rate of reaction. The slower the reaction the more oxide is formed, but in every case the last portion to be oxidized consists of 50-per-cent arsphenamine and 50-per-cent oxide.

4. *M*-amino-*p*-oxyphenylarsenious oxide ("arsenoxide") is oxidized only in alkaline solution. The nature of the process curve indicates that the reaction is catalyzed by a reaction product.

5. Neoarsphenamine shows a rapid oxidation on exposure to air, amounting to about 50 per cent in the first ten minutes, after which the rate decreases rapidly.

6. The nature and rate of oxidation of arsphenamine and neoarsphenamine to the corresponding oxides furnish an explanation of the increase in toxicity and trypanocidal activity of these compounds, when their solutions are exposed to air.

The Influence of Saccharin on the Catalases of the Blood.

BECHT, in the *Journal of Pharmacology and Experimental Therapeutics* for October, 1920, writes on this subject and states:

1. Four grammes of saccharin per kilo of body weight does not increase the catalytic power of the blood of cats when the drug is injected into the gastrointestinal canal.

2. Wide variations in the catalytic power of the blood were noted in two dogs studied over a period of 73 to 91 days.

3. Daily variations in the catalase content of the blood are wide.

4. Saccharin in doses of 4 grammes per kilo acts as a powerful gastrointestinal irritant, producing in most cases vomiting and in many cases diarrhea. The changes in the catalase content were within the limits of normal variation. The drug has no specific action in increasing the catalase content of the blood. Smaller doses show less gastrointestinal irritation but no effect on the catalase content of the blood.

5. Saccharin intravenously produced in practically every case a marked decrease in the catalase content of the blood.

6. Saccharin present in amounts varying between 4 and 0.5 per cent decreases the catalytic power of the blood *in vitro*. Thus the reduction in the catalytic power of the blood in animals injected intravenously with saccharin is probably due to the direct action of the drug upon the cells of the blood.

7. Since the red corpuscles and the content of catalase varied in the same direction

and proportionately in experiments where changes were noted, in all probability the mechanism of action of saccharin is mainly by alteration of the number of red cells per unit volume of the blood.

8. Removal of the pancreas has no specific influence upon the catalase content of the blood.

9. The action of saccharin is the same in the animal with pancreatic diabetes as in the normal animal.

10. An increase was observed in the catalytic power of the blood in 80 per cent of observations of patients with diabetes mellitus. Since the dose was so small and since the averages of all the changes were so small, about 2 per cent, and since there were relatively few cases, it is believed that this is of no significance.

Absorption from Serous Cavities.

CUNNINGHAM, in the *American Journal of Physiology* for October, 1920, states that his experiments do not settle the question of the feasibility of using the peritoneal cavity as a route for the administration of dextrose; but they furnish certain evidence which is of value, both in regard to its practical application and to the general reactions of the peritoneal mesothelium. The experimental results which are favorable for the use of this method are: the general effect upon the animals, the nature of the curve of absorption, the rapid recovery of the mesothelium, and the absence of adhesions. But the changes in the mesothelial cells cannot be considered as directly favorable, and may even prove a definite contraindication.

The animals he used suffered no ill effects as far as could be judged from their activity, general appearance, and weight. While the rats were not weighed every day, their weights were taken before the first injection, and occasionally thereafter; none were found to have lost weight, while several actually gained a little. It is evident that the length of time required for

the complete absorption of the dextrose solution was about the same in both series of animals; but the increase in fluid, soon after the injection, was considerably greater in the first than in the second. From these observations it is evident that the continued exposure of the surfaces of the peritoneum did not produce sufficient injury or change to decrease their ability to absorb this particular solution.

In addition to this conclusion these curves suggest the discussion of certain general features of absorption, concerning which we have very little conclusive evidence. Immediately after the injection of the sugar solution the total amount of fluid in the peritoneal cavity increases, and this can only be at the expense of the water in the tissues and blood stream. At the same time we may conclude that the sugar is passing out of the peritoneal cavity into the blood stream and tissue spaces, although this has not been established in these experiments by quantitative examination of the fluid.

In short an equilibrium is being established by osmosis and diffusion between the two systems: the sugar solution which has been introduced into the peritoneal cavity, and the contents of blood-vessels and tissue spaces. In considering the absorption of the solution after the equilibrium has been reached it seems evident that some other factor besides osmosis and diffusion must be involved. The most plausible explanation for this remarkable absorption, which takes place against the concentration gradient, seems to be that the sugar molecules are drawn over into the blood stream and tissue spaces by means of some difference in electrical potential; and this increase in concentration of the dextrose in the blood forces the water out of the peritoneal cavity. The evidence obtained from these experiments is insufficient to establish any hypothesis regarding the nature of this exchange.

The nature of the change in the mesothelium has not yet been established, and

upon this depends whether or not the reaction of these cells can be considered as a definite contraindication to the administration of dextrose via the peritoneal cavity. If the change is fundamentally an injury; if the desquamating cells are badly injured or dying, and if those remaining are unable to recover the denuded areas, then adhesions are likely to form and inflammatory processes to develop, if any organism should obtain access to the peritoneum. On the other hand if the change in these cells is the result of stimulation, if the cells are actively proliferating, if those cells which do separate are viable and continue life as free macrophages, and if the remaining cells are capable of renewing the denuded spaces so that only a few cell areas will be empty at any time, then adhesions should not develop and the protection against adventitious infection would seem likely to be as great as ever. Theoretical possibilities must include combinations of stimulation and injury, in which case any application would depend upon the ratio between the two.

These questions are most difficult to settle experimentally; the evidence obtained from these experiments tends to support the suggestion that the changes are due to stimulation. The mesothelium, after exposure to repeated doses of a 10-per-cent solution of dextrose during a period of fourteen days, does not show denuded areas larger than the space normally occupied by two or three cells; there is no evidence of injury or death, but rather of active proliferation in these cells; no adhesions have occurred, and it has been shown that recovery, either by the return to normal of the cells which have rounded up or their replacement by other cells, is complete in six days.

The distribution of this change over diaphragm, spleen, and omentum, while the remainder of the peritoneal surfaces is comparatively normal, would indicate that there is some special differentiation of the mesothelium in these regions. And it is

quite possible that the explanation of the observed reaction should be sought in this differentiation rather than in some injurious effect produced on the cells by the dextrose.

A Method for the Prevention of Colic in the Nursing Infant.

CURRENT, in *Northwest Medicine* for October, 1920, states that during the past five years he has worked out and followed a method which, after constant application in cases of colic of varied severity, has proven very successful in preventing the colicky attacks. Knowing that colic is caused by decomposition of food in the bowel, it was conceived that, by administering a food vehicle which would be antagonistic to a decomposing intestinal medium and which would render an intestinal digestive flora less liable to decomposing changes, this trouble could be prevented in the greater number of instances. The method consists in the giving of from one-half to one ounce of 3 to 4.5 per cent of a warm cereal gruel immediately before each nursing, except the night nursing, and before each and every nursing if necessary. The results obtained have been excellent. This technique has been used in all cases of colic, and requires no alterations, except the amount of the starch mixture required for a certain infant, and the strength of the starch mixture according to the digestive ability and tolerance of a certain infant for a starch food. Very few infants of whatever age have any perceptible difficulty in digesting a 3-per-cent starch mixture. The reports of Sauer and of Porter on the starch feeding of infants are sufficiently convincing. There is no doubt that starch as a food is better borne and better tolerated by the infant than we have been not long since led to believe. By administering cereal gruel in cases of colic the decomposing culture-field is removed and a less favorable culture medium is established for the development of the intestinal bacteria.

That the diastatic and amylolytic ferments are present in the digestive tract of the greater percentage of infants of all ages has been proven by Moro, Hess, and others. Starch is, no doubt, well tolerated during infancy and there are no by-products formed to produce an intestinal toxemia. Oatmeal gruel, wheat gruel, and barley gruel are the different cereal gruels used. Oatmeal gruel is indicated where there is inactivity of the bowel, as it favors the formation of the volatile fatty acids, and for this reason gives a decidedly laxative action. Wheat gruel has very little effect upon peristalsis. Barley gruel has a quieting effect upon the peristaltic action and is indicated in instances where the bowel is overactive.

The Use of Water in the Diseases of Childhood.

In the *Boston Medical and Surgical Journal* of October 28, 1920, TALBOT states that in cases of summer diarrhea it is surprising to measure the total amount of water lost in the feces when six or more liquid stools are passed in the day. They may contain as much as one quart, the greater part of which is liquid. If the diarrhea is complicated by vomiting, it is easy to see why the body becomes so rapidly dried out and the patient appears so critically ill. The most important factor in treating such a case is to introduce sufficient liquid into the body to bring the body fluids up to their normal dilution. Parents often say that the child refuses to take water, but Talbot has never seen a case in which a child could not be induced to take the required amount of water in one way or another. He recalls one such case in which a trained nurse, on the third day of an infectious diarrhea, was able to get 91 ounces into a child by persistence and ingenuity. The clinical results were startling, and the child changed in twenty-four hours from one whose recovery was doubtful to one whose recovery was certain. Although this

is an extreme instance it is characteristic. In estimating how much liquid should be introduced into the body, the amount that is normally taken during health should be taken as a standard; to this should be added about 50 per cent more to compensate for what will be lost in the stools.

Fever also causes an increased loss of liquid from the body. This loss, however, is more difficult to estimate because it is usually lost through the lungs. If with the fever there is also restlessness, the loss of water may be very great. If there is also diarrhea, the loss will be excessive, and it will be found that twice the normal fluid intake will not be any too much to prevent the appearance of alarming symptoms.

In pneumonia the situation seems to be somewhat different because the distribution of water in the body apparently is abnormal. Although water may be retained in the body, it is bound to tissues which do not normally require it, and unless extra water is given there will not be enough circulating liquid to maintain the normal equilibrium of the body. In argument for this is the fact that following the crisis, in a case of pneumonia, there is remarkable increase in the water elimination via the kidneys and skin. It is therefore very important that additional water be given in cases of pneumonia, both to make up for the fever and to supply the tissues with the amount of water that they need.

In intestinal intoxication in infants, associated with acidosis, there is impaired elimination of liquid from the kidney. This may be ascribed either to the loss of water in the stools in such great amounts that it is impossible for the infant to ingest sufficient fluid to replace that loss, or to the fact that the patient refuses to ingest liquid or vomits practically all that is taken. As a result the tissues become dehydrated. This may be cured by introducing enough water into the body.

The best treatment is, of course, prevention of desiccation of the body. The methods of introducing water into the body depend

upon the symptoms of the case under consideration. Even when there is no vomiting, and during the early stages of febrile diseases, a record of the amount of liquid ingested should always be recorded and added up at the end of each twenty-four hours. In this way only is it possible to know how much fluid the child is receiving. If this is taken into consideration early enough and the child is given the amount of liquid which would normally be ingested during health plus the estimated amount lost as a result of the disease, fewer untoward symptoms will appear. A study of the records of the liquid ingested is often highly interesting and the information thus obtained is very important. Sometimes it is necessary to force water when the child is not receiving enough. This should be done when necessary in all instances except when it is done at the expense of the child's strength or when it causes vomiting.

The second method of introducing water is by the rectum. Success with this method depends very much upon the means employed. Very little success can be expected during diarrhea when there is excessive peristalsis, but it should always be tried. In other conditions without diarrhea, water may be introduced once in four hours very slowly, taking half an hour to introduce three to eight ounces, according to the age of the child, or it may be administered by the Murphy drip, four to five drops per minute, for periods of three hours. This should be alternated with rest periods of three hours in order that the rectum will not become irritated and peristalsis started up.

Finally water may be introduced subcutaneously or intravenously. In most instances subcutaneous injection of water is sufficient, but occasionally when very rapid results are essential it is necessary to introduce it intravenously or intraperitoneally. The water should be absolutely sterile and should be isotonic with the blood—that is, a normal saline solution. From three to sixteen ounces may be introduced at one

time into desiccated children. It is surprising to see how quickly they react to this form of medication. When there is any desiccation of the body the results are practically always quick, and like those of a very strong stimulant.

Errors in the Diagnosis and Treatment of Myocardial Insufficiency.

GREENE, in the *Canadian Medical Association Journal* for September, 1920, states that the points which he deems fundamental may be summarized thus:

1. The harmful effect of the traditional optimism on the one hand and pessimism on the other with respect to the course of established cardiovascular disease and the after-lifetime of the cardiopath.

2. A faulty method of approach which leads one initially to seek to establish the abnormal rather than to prove the existence of the normal.

3 and 4. The tendency to undervalue systolic or postsystolic apical non-structural bruits, and, on the other hand, to focus attention upon the valvular lesions rather than the condition of the heart muscle, which is basic in all cases, together with a lack of understanding of the vital importance of tonicity and the readiness and frequency with which it is impaired, and a failure to appreciate the large proportion of deficient hearts which though diseased are not the seat of valvular disease or of frankly expressed myocardial inflammation or degeneration and are wholly or relatively silent.

5. A failure to recognize fully the fact that the heart invariably is affected in acute infections of an exhausting type and in major surgical operations, the chief source of weakness associated with these conditions being the myocardium; and that in consequence it becomes necessary not only to watch the heart with great care under such conditions, but also to insist upon longer convalescent periods than are at present allowed, and wherever possible in-

vestigate the heart condition from time to time during a considerable period thereafter.

6. The fact that in all probability nine-tenths of the cases of abnormal enlargement of the heart, whether due to dilatation, hypertrophy, or both, under present clinical methods remain wholly unrecognized.

7. Certain fundamental factors of error exist, embracing the almost universal employment of a false normal for the transverse cardiac diameter, and a failure to appreciate the extreme variations which may exist owing to fundamental differences in the type of bodily structure. To this may be added the continued general employment of landmarks almost wholly undependable.

8. The wide employment of the flat-finger method of percussion which cannot yield accurate results either with respect to the right or the left border of the heart in a large proportion of the cases.

9. An unfortunate tendency to underestimate not only the actuality but the frequency of a readily produced cardiac overstrain not infrequently associated with lesser grades of dilatation.

10. A general failure to recognize the subjective symptoms of persisting myocardial inadequacy and reserve impairment such as constitute a most important factor of the evidences of this condition when existing in its minor but vital degrees.

11. A failure to recognize the extreme value of rest, absolute or relative, as indicated, and the administration of adequate doses of digitalis as a diagnostic measure.

12. The as yet but imperfectly recognized importance of a type of individuals embracing a considerable proportion of the population who are from birth actually or potentially inadequate, structurally and functionally, and in various degrees unable to meet excessive or even moderate stress or strain in life and living.

The treatment of cardiovascular disease at present is in general inefficient, unsystematic, desultory, halting, and fatally belated, whereas it should be early, timely,

efficient, rational, systematic, and sufficiently prolonged in appropriate cases to secure for the cardiopath the highest possible degree of disease retardation and myocardial rehabilitation.

Finally, as Greene has stated many times, the failure to apply to the cardiopath the

same wise procedure with respect to diagnostic and therapeutic initiative, timeliness, accuracy, and systematic thoroughness, together with opportunities for institutional care, which now is granted the victim of tuberculosis after centuries of like neglect is wholly unpardonable.

Surgical and Genito-Urinary Therapeutics

The Intensive Administration of Arsphenamine.

GOODMAN (*New York Medical Journal*, Oct. 2, 1920) reports on intensive therapy in 80 hospitalized syphilitic negro patients. The cases were divided among the syphilitic periods as follows: 28 primary cases; 23 cases of silent generalization; sixteen cases of secondary; latent tertiary, four cases; active tertiary, nine cases. At least half the patients presented the initial lesion on or near the frenum. Goodman expresses the opinion that practically every lesion at the frenum harbors the *Spirochæta pallida*. A fairly common type of initial lesion was one at the meatus. Goodman means by silent generalization patients who present chancres with no secondary lesion of the skin or mucous membrane and a four plus positive. He states that he has seen instances of the destruction of the entire glans penis in which the patients had no prior treatment. Many of the patients were self-treated. One patient, with no symptom or sign other than four plus Wassermann, was admitted for bed wetting; he was unimproved by treatment.

The plan of treatment was on lines laid down by Pollitzer, which Goodman terms the intensive method in distinction to the intermittent method. The intensive method consists of the daily administration intravenously of arsphenamine for three doses. Each dose consists of four decigrammes dissolved in fifty cubic centimeters of freshly distilled and boiled water, and then alkalinized to comparative neutrality with

fifteen-per-cent sodium hydroxide. This mode of treatment is a desirable variant of the *therapia sterilisans magna* of Ehrlich.

The theoretical reason for the failure of this method was that the single dose killed a large number of spirochetes, but that some few escaped, and later by multiplication were nearly as numerous as before, sensitized to arsenic and more dangerous. Another reason was that the excretion of the arsphenamine was begun almost as soon as injected, and that in the first few hours most of the drug was out of the body.

Since arsphenamine is essentially thirty per cent arsenic, it appears that, injected intravenously, ninety per cent is excreted by the kidneys in the first three days. The intensive method counteracts both of these undesirable features because the concentration of the arsenic product in the blood is kept at an efficient high level. Following the intravenous medication, mercury salicylate in grain doses was given once each week.

The negro is a bad subject for mercurial therapy because of the ease with which even small doses cause stomatitis. This occurs despite the care that the patients take of their teeth and gums. They used tooth-brushes twice daily and the mouth-wash after each meal.

On odd occasions a patient would vomit after partaking of the light repast provided six hours after receiving the injection. This did not contraindicate further use of the drug, but the patient went without his luncheon thereafter. The greater number of

the patients received arsenobenzol (Schamberg), which gives remarkably few reactions of any kind.

Eighty hospitalized syphilitic negro men were given the intensive arsphenamine treatment as suggested by Pollitzer. The clinical results were immediate in all uncomplicated syphilitic manifestations. The infectiousness of the patient was reduced thereby much quicker than with the same amount of the arsphenamine introduced intravenously by the so-called intermittent method. The changes in serology were most encouraging, but no attempt was made to base conclusions.

The public health value of this method of therapy should be emphasized since the period of hospitalization of infectious syphilitic persons is much reduced. This is an important consideration in the prophylaxis of syphilis by treatment.

Fatal Postarsphenamine Jaundice.

HYMEN (*New York Medical Journal*, Oct. 2, 1920) refers to the paper of Lynch and Hoge on four fatalities. He states that in a review of several thousand doses of arsphenamine given at the Venereal Clinic of the Long Island Hospital he has been able to demonstrate seven cases of toxic jaundice no doubt due to this specific drug. All of these patients recovered. The fatality was produced by a single dose of arsphenamine. A strong woman, weighing 170 pounds, presenting gonococcal infection and treated because of a history of miscarriages and a positive Wassermann, was given 0.4 gramme of arsphenamine intravenously, followed promptly by nausea and vertigo; thereafter no symptoms until the fifth day. The patient then experienced a general lassitude, urine and blood examination negative. For the next two weeks the patient continued to grow weaker without any other signs developing. One month after receiving the arsphenamine she became slightly jaundiced. Thereafter developed pain in the right thigh; some purpuric spots developed over the painful area,

others later over various parts of the body, and jaundice increased in severity, the stool containing bile. Vomiting came on, bleeding from the nose, and finally semidelirium and death. Post-mortem examination showed hemorrhagic phenomena in one or more of the viscera; the kidneys exhibited a type of tubular nephritis much like that seen in mercurial poisoning. The liver was slightly large and purplish-red in color. The cut surfaces presented an essentially normal appearance. In all the cases reported the patients were given both arsenic and mercury.

Tuberculosis of the Hip.

STEWART (*Journal of the Missouri State Medical Association*, September, 1920) bases his study on 74 cases, most of them developing before the age of eight. The effect of trauma is difficult to determine.

Of the various symptoms and physical signs usually ascribed to tuberculosis of the hip by text-books on orthopedic surgery, persistent limp and muscle spasm on attempted passive motion of the hip are the constant ones and are the cardinal signs. They are the first to appear and the last to leave and, demonstrated in a child, are enough to warrant confinement to bed until a careful study has eliminated tuberculosis of the hip. Night cry was a fairly constant symptom in the series, but pain when awake, except on sudden motion of the joint, was not common in the early cases. Evening elevation of temperature, night sweats, loss of weight, and symptoms commonly associated with tuberculosis, did not appear in a majority of early cases. Deformity, most apparent with the patient lying supine, was present in most of the cases and was represented by various degrees of flexion, usually accompanied by some abduction or adduction. Muscle atrophy is due to disuse and does not become conspicuous until motion has been restricted for some time. Measured shortening is not found until some deformity of the head or neck has taken place. None of these signs, except limp and muscle spasm, appear con-

stantly and are not at all necessary in arriving at a diagnosis.

A positive diagnosis of tuberculosis of the hip cannot be made except by the examination of material from the involved area. A diagnosis conclusive enough to warrant rational treatment as such can be made, however, from the careful study of the case, preferably in a hospital where Roentgen ray and laboratory facilities are at hand and a record of the patient's symptoms, night and day, can be accurately kept.

The examination of every patient complaining of suspicious symptoms should include examination of the gait, if walking, attitude while lying, movement and restriction of movement of the hip and adjacent joints, the examination made with the child stripped of all clothing. The patients themselves often complain that their pain on motion is confined to the knee-joint. Muscle spasm will guard the motion of the affected joint and will give the positive clue in these cases. Disease of the lower lumbar vertebrae and sacroiliac joints is not easily differentiated. Involvement of these areas will often give pain referred to the hip-joint, and irritation of the psoas muscle supplies the deformity and restriction of motion. Abduction and external rotation, however, are usually not restricted in vertebral tuberculosis, while if the disease is in the hip-joint these motions are prominently limited. One of Stewart's cases of vertebral tuberculosis so definitely simulated hip disease that he was treated by leg traction for several weeks in spite of negative Roentgen rays until a slight prominence in the lower lumbar region caused Roentgen rays to be taken which showed beginning destruction of the fourth lumbar vertebra. Even at this time restriction of motion of the spine was not marked. Syphilis affecting the hip may give the cardinal signs of tuberculosis, and the Roentgen ray may show destruction of the head of the femur which cannot be definitely said to be one or the other. The positive Wassermann should make the diagnosis of syphilis fairly conclusive, but it must be remembered that it is possible for

a child with syphilis to have tuberculosis of the hip, and such a case should be treated with fixation until the lesion responds to syphilitic treatment.

Perthes' disease, while it gives the cardinal signs of tuberculosis of the hip, shows in the Roentgen ray as a flattening of the head of the femur without the irregular outline of actual bone destruction. These cases should be observed frequently and carefully, and in the opinion of the writer should be treated as tuberculosis until tuberculosis is positively ruled out or the early disappearance of the symptoms makes the diagnosis of Perthes' disease the more probable one.

The prognosis should never be too sanguine. Under the most careful rational treatment the course is long and tedious, and frequently there are setbacks discouraging to both doctor and parents. The parents should be made to understand thoroughly the seriousness of the condition when treatment is begun, and at the same time should be assured that it is by no means hopeless, and that by infinite care and attention to the details of treatment the patient may obtain a good functioning joint without deformity. The possibility of abscess formation should be mentioned, and occasional unpreventable metastasis to the meninges and lungs. Seen early and under the most favorable circumstances for treatment the minimum time for treatment with apparatus should be put at two years, but the great majority of cases will require much longer time.

In the hospital they are immediately placed on a Bradford frame and enough traction exerted on the leg to overcome muscle spasm. In cases with deformity, traction is started in the line of deformity and the line gradually changed until the desired position is obtained. When deformity has been overcome and acute symptoms have disappeared, an ambulatory splint is applied and the patient is allowed to be on crutches for an increasing period of time each day. The type of splint used depends largely on the care the patient is liable to receive after leaving the hospital. If con-

ditions at home are considered such that the patient is liable not to receive much care and attention, a plaster-of-Paris spica is applied from the costal margin down to and including the foot, and an extension sole is placed on the unaffected side.

After leaving the hospital these patients are seen in the clinic once a week, the condition of the brace or cast noted, and any desired changes made. Muscle spasm is gently tested, but frequent attempts to ascertain the amount of motion in the joints are strictly avoided. If an abscess appears superficially the patient is once more placed on a frame with traction, and if it shows any tendency to undermine other tissues it is incised, and pocketing is freely opened, pus is evacuated, and the wound closed without drainage.

When cases wearing apparatus have improved to such an extent that no muscle spasm or pain on motion can be demonstrated, they are fitted with what is termed a convalescent splint which is attached to the shoe and places most of the body weight on the tuberosity of the ischium instead of the hip-joint. Crutches and extension sole are then discarded and the patient is allowed to walk. After this has been worn several months without symptoms, it is left off for increasing periods of time so that normal weight-bearing is practiced gradually.

Twenty-eight of the cases were located for an examination of their condition at the present time, and the results in the cases examined were gratifying. Eighteen cases had no active symptoms—that is, no muscle spasm or pain on motion. Of these quiescent cases two had apparently firm ankylosis in good position, and the remaining sixteen had motion varying from a few degrees to almost normal. Of this number thirteen had been without apparatus of any sort for more than six months, and five were still wearing convalescent braces. Eleven cases had from 1 to 2.5 inches shortening, while seven had less than 1 inch. The records showed that four cases had died of tuberculosis.

Gastric and Duodenal Ulcers.

McCLURE and REYNOLDS (*Boston Medical and Surgical Journal*, Sept. 9, 1920) summarize extensive hospital records as follows:

The symptomatology of peptic ulcer may be typical or atypical. The typical type, by aid of the radiographic findings, may be diagnosed with a high degree of accuracy. In the diagnosis of the atypical class x-ray studies are of the utmost value; in many cases the diagnosis cannot be made without them.

X-ray studies should form a part of the physical examination of every gastrointestinal case. Their importance in the diagnosis of peptic ulcer is second only to that of the history of the case.

X-ray studies are the most efficient and accurate aids in the differentiation between functional and organic pyloric obstruction, and between ulcer and cancer.

In the great majority of cases laboratory findings are of less value as an aid in the diagnosis of peptic ulcer than those obtained from radiographic studies.

The laboratory findings valuable in diagnosis are gross amount of blood in the vomitus or gastric contents, the frequent vomiting of old food residues, and tarry stools. Findings of less value are the persistent presence of occult blood in the stools, the presence of food residue in the gastric contents, and the presence of free HCl in the gastric contents.

The Results of Induced Pneumothorax in the Treatment of Pulmonary Tuberculosis.

SAUGMAN (*Lancet*, Oct. 2, 1920), on the basis of twelve years' experience with 430 patients who were subjected to about 10,000 punctures, believes that the method is of distinct value. After two cases of sudden death occurring in 1912 there have been no accidents in a series of 272 cases, so the mortality of the operation has sunk to below one-half per cent. The two fatal cases were probably due to gas embolism, although it could not be proved by examina-

tion. With the present cautious technique there are no dangerous complications from the injection of gas.

After the elimination of a certain number of cases not suited for a comparison which the author wishes to make, he considers 257 patients belonging to the third stage and all showing tubercle bacilli in the sputum. In 172 cases he succeeded in forming a pneumothorax, although not always a large one; these he calls effective cases. In 85 cases an efficient pneumothorax could not be formed; these he calls the ineffective cases. The number of those who in 1919, *i.e.*, 2 to 11½ years after discharge, could be classed as able to do general or light work in the "effective" cases is more than three times as great as in the "ineffective" cases, while the mortality is only about two-thirds as great. In cases of complete pneumothorax without notable adhesions the percentage of capacity for work after 3 to 13 years was about 70; in cases of incomplete pneumothorax it was about 11.

The author states that he knows of no other treatment which gives third-stage, sputum-positive cases a 33-per-cent chance of being able to work after seven years. He thinks it is a somewhat dangerous thing to cease treatment before the lapse of one year. When peculiar circumstances favor it in very recent cases, when the lung is not fibrous, when the pneumothorax is complete it will perhaps be sufficient to continue the treatment for only one year; but usually at least two years' compression will be preferable. Chronic cases should be continued for two or four years. Even after four years relapses are not impossible. The cessation of pneumothorax is always in a measure a risk. It will usually be sufficient where the treatment has lasted for some years to inject gas every second or third month.

A patient who during several years has been treated with a pneumothorax with good results feels, apart from a little dyspnea, quite well and is able to work like a healthy man, unless hard physical exertion is required. For instance, a busy medical

practitioner has continued his work for five years without trouble, although he had to cycle during last winter's epidemic of influenza when benzene was scarce. The only real risk such a patient runs is that of pneumonia in the other lung. The writer has had one such case; the patient was a young medical man, who had been treated during six years for a practically hopeless condition, but had been able to finish his studies and do his hospital work. Perhaps he might have been saved if he had allowed the gas to be withdrawn from his pneumothorax, which he, being overcautious, had kept superfluously large; but there was no chance of performing such an evacuation. The post-mortem examination in this case showed complete healing of the lung; there was a cavity completely compressed. Examination of a series of slides of its walls showed one single giant cell; but bacilli could not be found, and inoculation of a guinea-pig gave a negative result. This man could, no doubt, have let his lung re-expand long ago; at any rate, it would have been sufficient to maintain a very small pneumothorax, which would have allowed the "sick" lung to work again, while a thin space of air would have been kept up with a view to an enlargement should this be necessary.

In the case of incomplete but efficient compression it will usually be right to continue the pneumothorax treatment for good, unless the treatment is abandoned in favor of a total or partial thoracoplasty, which will in many cases be preferable.

Of alternating compression, first of one then of the other lung, the author has had 7 cases—two patients, discharged in 1918, being included. They all died except one, who first had his left lung compressed for eight months, with cessation in July, 1913, and in whose right side a pneumothorax was formed in January, 1914, which lasted sixteen months. Since 1915 he has been quite well and able to work. Though such an alternating treatment in most cases will be without result, it is seen that in single cases it can be of use, and we therefore are justified in employing it, especially when

there is a rather long interval between the cessation of the first and the beginning of the second treatment.

An effusion in the pneumothorax cavity is one of the most frequent complications; of 143 patients, 79 had an effusion in the sanatorium (31 large, 23 middle-sized, and 25 small); in four cases an effusion was found at the induction of the pneumothorax.

It is astonishing that the results in effusion cases were entirely comparable with those treated by artificial pneumothorax. Still more astonishing that many of the patients now completely fit for work have passed through severe suppurative pleuritis with tubercle bacilli in the pus, and persisting for several years.

A surgical colleague remarked a couple of years ago that he hoped to become old enough to see the burial of pneumothorax treatment. He did not live long enough, however, and though he had lived ever so many years he would not have seen it. The pneumothorax treatment has got a permanent place as an important remedy in our therapeutic armory, a place that only ignorance of the methods and its results can deny. It is not unjustly that Holmgren in his chapter in the *Scandinavian Text-book of Medicine* characterizes it as the greatest progress made in the treatment of phthisis since Brehmer's and Dettweiler's time.

A New Treatment of Cancer.

KOCH (*Medical Record*, Oct. 30, 1920) after discussion of the accepted theory of thrombokinese, treated cancer patients with tissue thrombokinese and with tissue thrombin, amounts varying from 1/100 grm. to 1/2 grm. being injected subcutaneously, generally in the patient's buttocks, the substance being dissolved or suspended in normal salt solution in quantity from 1 to 10 Cc.

Quantities of the kinase insufficient to cause extensive intravascular coagulation of the blood, and therefore immediate death in the patient, were found actually to increase cancer growth and, moreover, to

cause so great a negative coagulation phase of the patient's blood that hemorrhages were profuse and the continuance of such treatment threatened the patient's life. The site of the injection showed tissue death. Therefore such therapy was discontinued as useless and harmful.

The use of the tissue thrombin, however, brought very different results. Locally, where injected in the hip, no sign of disturbance was produced—no more than if normal salt solution were injected.

There was no change in the patient's blood coagulation time. The microphotographs show the effect of the injected tissue thrombin upon cancer cells. These sections were taken from a large squamous-cell carcinoma of the neck. The most pronounced changes are, first, a disappearance of the cells lining the basement membrane. These are the cells closest to the blood supply, the germinal cells of the cancer. Naturally the tissue thrombin reaches them first and they are the first to be destroyed. As rapidly as they disappear angioblastic tissue replaces them. Apparently the carcinomatous clumps are being devoured by angioblastic tissue just as takes place in the development of bone and in the organization of a blood-clot. Investigation of the chemistry of these three phenomena reveals that they are essentially the same process. The changes preparatory to organization of the cancer tissue are nucleolysis and a fibrin formation in the cells, and a swelling of this fibrin which produces a hyalinization of the cancer protoplasm. This is a digestive change in the clotted protoplasm which accompanies the ingrowth of the angioblastic tissue.

The clinical features that accompany this change induced in the cancer are for the first twenty hours after injection practically negligible. There is no change in the heart-beat, in the respiration, or in the comfort of the patient. Locally, in the hip where the injection is given, there is no reaction at all. After twenty-four hours the injected material has been taken up by the circulation and lodged in the cancerous tissues, where it now shows its work. The

cancerous parts become swollen, more painful than usual, and reflexes associated with the part are augmented and fever develops, especially between twenty-four and thirty hours after injection, generally lasting from two to six hours, and as this subsides the affected parts become smaller and less tender than before treatment, and there is less pain. The patient, however, may be quite tired out the next day, but the following day finds him more normal and buoyant. As a rule, after two injections hemorrhages have stopped, not to return, and pain likewise, as treatment proceeds, rapidly passes away.

Nine case histories are presented in full. Every carcinoma case, generally twenty-four hours after treatment, developed a febrile reaction, accompanied by increased focal pain. Moreover, a systemic intoxication as expressed in a grippy feeling accompanied the reaction. These phenomena were no doubt due to the swellings of the coagulated tissue and to oxidation of the absorbed products. The focal reaction is of value in determining the distribution of the cancer tissue. For instance, those cases of breast cancer with pulmonary involvement developed dyspnea and dry cough during the reaction.

The author cites the case of a patient weighing 170 pounds, with marked bilateral pulmonary involvement, as shown by the x-ray and dilatation of the heart, especially on the right side. In the right breast was a hard mass 9 cm. long and irregularly 4 cm. thick. The skin was movable about it. In the left axilla were a mass as large as a lemon and also several smaller masses. The left breast had been removed two years previously; the scar remaining appeared healthy.

This patient suffered quite severe dyspnea, the respiration running generally around 38, while the heart-rate was variably 140. She was very cyanotic and the slightest exertion brought on intense dyspnea. Cough was incessant. The patient could not repeat more than two letters of the alphabet without taking breath. She was given six treatments, of

10 mg. each, weekly. The improvement in respiration was so marked that she could get up and walk about, only breathing twenty-eight times per minute. In the meantime the mass in the right breast disappeared, and the mass in the left axilla had diminished in size to that of a walnut. During the reaction periods she required constant stimulation, and even then the cough and dyspnea were almost unbearable. Her reaction temperature varied between 101° and 102°. After having improved so markedly, Koch risked a treatment of 50 mg., which proved to be too much for the patient, and she died in a reaction of cardiac failure. There was sufficient cancer left in the lungs, no doubt sufficiently swollen during the reaction, to obstruct the pulmonary circulation and cause failure of the right ventricle. An autopsy was not obtainable.

This illustrates that in very extreme cases the focal reaction also may be dangerous and that here the dosage must be guarded.

The gastric ulcer case showed no febrile reaction. We, therefore, now possess an additional means of recognizing cancer by the febrile reaction elicited by this treatment, and since this is incident to the chemical and physiological properties of the cancer tissue, it depends upon the intrinsic essential structure of the cancer and is therefore more valuable as a diagnostic feature than the microscopic characteristics. Furthermore, a good thermometer is the only instrument needed to estimate the fever, and the personal equation for error cannot be so great as that to which the pathologist is subject.

The treatment, as illustrated by the cases presented, shows a disappearance of the tumor and its attendant cachexia, return to normal of the blood chemistry—the alkalinity, for example; increases in the blood count and hemoglobin content—a doubling of the blood count in four weeks, for instance; increase in weight to normal or above normal, as in one case—often an increase of 40 pounds; complete disappearance of pain and soreness and return of function, as in one case in which a

previous achlorhydria gave place to a 0.9-per-cent HCl content in the gastric juice, incident, of course, to the return of the blood alkalinity to normal. The rapid recuperation of the patient after the carcinoma has disappeared, and the loss of easy fatigability, as demonstrated by these cases, are also significant.

The sequelæ are also physiological. In a region as the breast of Mrs. P. a deficiency exists in place of the cancer tissue. In a region where there is a necessity for replacement of the cancerous area by scar tissue this takes place, as in the case of Mrs. B., where a large vesicovaginal fistula was entirely replaced by scar tissue and the deficiency made good.

That the issue thrombin itself is not injurious to the patient is illustrated in the cases presented by failure to obtain a reaction after the cancer tissue has disappeared, by the steady gain in weight during treatment, and by the increase in the blood count and in the hemoglobin content during and after treatment, and by the normal non-coagulable nitrogen content of the blood after treatment, which indicates that no injury has been done to the kidney.

The Spinal Sign in Gastric Crises.

BROWNING (*Medical Record*, Oct. 30, 1920) observes that of the various crises and episodes that occur in the course of tabes the gastric form is accounted the most frequent. And all the severer seizures of this kind are so distressingly exhausting, and sometimes even dangerous, as to demand careful attention. The suddenness of onset and urgent character of these attacks do not favor careful observation. At least the customary descriptions mention little more than the emesis, prostration, and pain.

There is one sign in connection with these attacks that has either never been noted or has not found general recognition. If observed at all it has doubtless been passed over as too insignificant for mention, but for many years the writer has found it

useful as a diagnostic aid, and of recent years also as a therapeutic indication.

It is a relatively easy matter to elicit the sign, and it can be briefly described. It consists of a point or small area of tenderness just to the left of the spinal column, corresponding to the fifth dorsal interspace or one at about that level. It is always to be found on the same side as the stomach. It may extend to more than one space, though usually most marked at a definite level. It rarely involves the other side, and then only in minor degree.

The location relative to the spinal column is similar to that in so-called spinal irritation; but is distinguished by its unilateral character. A couple of slow searching strokes along the side of the spinal column by the tips of the thumbs or even of the fingers soon settles the question. An evident wince on the part of the patient or an expression of pain shows when the tender spot is reached.

Because a tabetic has a little nausea or gastralgia is not full proof of a crisis. In typical cases of this kind the sign appears to be regularly present for a time at least. Whether it precedes the onset of a crisis cannot be stated, but it has always been found as soon as a crisis case was examined.

Within a few days of the subsidence of the vomiting and concomitant distress this point of special tenderness rather rapidly subsides. And even toward the end of a prolonged attack the tenderness may become less marked. It is the more in evidence as the tabetic is often relatively analgesic.

It is relevant to ask what is the point of origin of gastric crises? Although the systemic or luetic condition is the underlying etiologic factor, the immediate cause is more likely some intermediary process.

Whether the vomiting is of central origin, cerebral in type, a view largely held by Germans, or is due (Mills and others) to disease of the vagus, or is analogous to the pain and other crises of tabes and hence perhaps radicular in origin, does not seem to be determined.

Pain, anorexia, and distress may terrorize the patient. Many have been subjected to operations in good part unnecessary. Occasionally prostration suggestive of a moribund state lasts for days, with but gradual recovery. Together then such cases make a record of suffering so severe and often recurrent as to warrant common sympathy and emphasize the need of something better than haphazard therapy.

The almost invariable way is to have prompt recourse to morphine or its congeners. But while this may numb the pain it greatly aggravates the nausea, upsets the digestion still more, and tends to prolong the attack. These patients also but too easily acquire a habit for such drugs. Some plan consequently is demanded that if possible does away with the use of opiates and anyway reduces their use to a minimum.

In fact Ostnakow (in Russian 1906; v. *Neurlgo. Centbl.*, 1909, pp. 14-17), after stating that the immediate cause of these crises has not been worked out, recognizes a toxic origin, and gives good reasons for attributing the development of gastric crises, in large part and sometimes wholly, to the use of morphine or other sedative.

As comparable crises have been reported in Graves's disease, in syringomyelia, and perhaps in other conditions, it is possible that the present plan is not then as applicable. In the tabetic form there are two general lines of attack that have proved useful.

In the first place the irritation, presumably at the nerve root of the ganglion, needs consideration. For even if the tenderness be but a sequel, some direct connection is evident, and a reverse influence is quite possible. Some form of counter-irritation locally over the tender spot can be readily applied. For this doubtless any one of various favorite methods can be adapted to good purpose. The writer happens to be in the habit, for this particular purpose, of having blue ointment, or else the 25-per-cent oleate of mercury, rubbed in along the region of the tender spot. A half-drachm or less suffices, and this can be repeated once a day as required.

It may be in part the massage and in part the mild skin irritation, or some absorptive effect, or some remoter action that does the most good. It is at least a rational method, and seems to be of material aid in limiting the crisis.

In other painful attacks in tabetics it is sometimes possible to find a tender point corresponding apparently to the exit of the respective nerve from the spinal column. In such cases also a similar plan over the tender spot beside the spine can be profitably adopted.

Where the pain is severe or an immediate impression is imperative, recourse can be had to the therapeutic *x*-ray locally at the region of the sensitive root. This has long been used in a similar way for other tabetic pains. Otherwise, as far as practicable, it is well to begin treatment with counter-irritation, and follow with the *x*-ray if necessary.

Lumbago as Related to Railroad Injuries.

LILE (*International Journal of Surgery*, October, 1920) contributes a paper on this subject, observing that apparently the causes have been as numerous as the cases, so that he thinks the actual cause cannot be defined. Suffice it to say that from stubbing the toe to lifting or straining to lift heavy weights, stooping to pick up something or to tie a shoe, each has its quota of cases of lumbago following. But its definition could not be well improved on if called a "Hell of a spasmodic pain in the lumbar region."

It should always be differentiated from direct traumatism, renal colic, acute nephritis, perinephritic abscess, uterine disease, caries of the spine, ileosacral subluxation, lumbar neuralgia, arthritis, and tuberculosis of the spine.

Lumbago occurs much more frequently in men than in women. Its duration varies from several days to several months.

First, rest in bed, a good purgative, preferably a mercurial, some of the non-opiate-containing drugs for pain, and lastly,

strapping the back with adhesive plaster. This plaster must be put on taut. The author's plan is to begin about the midaxillary line on one side, pull taut diagonally downward across the back to just about the middle or lower part of the glutei muscles, cross this from the opposite side, then another and another layer until the back is firmly strapped. This will hold all the muscles of the back and prevent the spasms from recurring. He has found this latter method the most effectual in treating lumbar backache, no matter what the cause.

It is not unusual to find that sciatica—the worst pain to which the human race is heir—follows these attacks of lumbago.

Strapping the back as above mentioned is the most efficient treatment even if the cause be "Spanish flu."

Two Strains of the *Treponema Pallidum*.

The *Pennsylvania Medical Journal* for October, 1920, notes that Levaditi and Marie have apparently proven that there are two strains of the *treponema pallidum*, the more common in occurrence producing typical Hunterian chancre, the wide-spread secondaries, and in the tertiary stage invade the viscera and bones. This is named the "dermatrophic virus." The other strain of organisms produces atypical chancres, leads to unimportant secondaries, and quickly involves the central nervous system. This is termed the "neuratrophic virus."

"The facts adduced in the memoir show that between the *treponema* of ordinary syphilis and the *spirochetæ* of the postsyphilitic, cerebral, and spinal lesions, such as are obtained from the blood (and probably also from the brain), there are striking differences, as well from the biological point of view as from the point of view of the lesions that they occasion in men and animals. These differences persist, in spite of a considerable number of passages through the rabbit, and may be summarized thus:

"In the duration of the period of incubation, which is a great deal longer in the case of the neuratrophic virus.

"In the character of the manifestations produced in the rabbit: an indurated chancre in the case of the dermatrophic virus, papulosquamous lesions in the case of the neuratrophic virus.

"By the microscopic peculiarities of the lesions: a marked affinity for the epithelial tissues on the part of the neuratrophic virus, vascular and sclerotic alterations being a great deal more marked in the dermatrophic virus.

"By the evolution of papulosquamous lesions through the increase and dissemination of the *spirochetæ* of general paralysis in the rabbit; slow evolution, late spontaneous healing, reappearance after a period sometimes very long.

"By the pathogenic power of the organism: marked virulence for the lower monkeys, anthropoid apes and man on the part of the dermatrophic virus; no pathogenesis through cutaneous inoculation of the *spirochetæ* of general paresis.

"Lastly, by the fact that animals healed of the lesions provoked by one of the *treponemas*, and which through this fact have acquired a refractory state as regards that *treponema*, continue, in the generality of cases, to be receptive for the other *spirochetæ*."

It is interesting to note in closing this summary of the investigation that the virulence of the dermatrophic virus is entirely unmodified for monkeys, anthropoid apes and man by passage through rabbits, while that of the neuratrophic virus is entirely destroyed.

Through a laboratory accident on the one hand, and a voluntary sacrifice on the other, they were able to add the effects of the viruses upon human beings to their experimental investigations upon the lower animals. Thus, "a person among those participating in the investigation accidentally infected himself by a needle prick, with the juice expressed from a chancre on a rabbit, and containing a great number of mobile *treponema*. The inoculation was on the back of the hand and took place January 7. On January 20, thirteen days afterward, the blood was Wassermann negative. There

was no lesion until January 31, when a slightly erythematous nodule was noted, becoming distinctly papulous by February 7—thirty days after the accident. The papule indurated slightly and became covered with scales in the center. Wassermann negative. No enlarged glands, no secondaries. The lesion preserved the same general appearance until the 10th of March, when it paled. The Wassermann reaction, which was negative on February 24, became positive on March 10. The lesion was shown to be rich in treponemas. It healed completely March 24. The case was followed for six months. No secondaries. The Wassermann remained positive (last observation June 16).

This showed that the dermatrophic virus remained virulent for man even after having been kept growing in rabbits from 1908 to 1914. Now compare this with the other human observation made with the neurotrophic virus, which experiments upon lower animals showed to lose its virulence: "X., never having had syphilis and showing negative Wassermann reaction, was inoculated by scarification on the right arm with a juice rich in treponemas taken from a rabbit inoculated for the first time with fresh human virus. There was no reaction, either general or local, during long months of observation, and the Wassermann reaction remained negative after five years."

Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis.

BULL (*Lancet*, Oct. 16, 1920) observes that the object of extrapleural thoracoplasty is to produce collapse of the lung. Of the various methods employed for that purpose, the best is that which combines the least risk to the patient's life and future capacity for work, with the greatest likelihood of a sufficient falling-in of the wall of the chest and resultant retraction of the lung tissue, at the same time putting the lung more or less out of action. Those surgeons who have specially occupied themselves with this branch of surgery—

viz., Friedrich, Brauer, Sauerbruch, and Wilms—have more and more closely approached each other's methods, and apart from the question of priority there is now a practical unanimity in the main features of the method, the greatest stress being laid upon the removal of the posterior section of the rib. This idea constantly appears in the "eighties" and "nineties" during the development of suitable methods of operating for old empyemata. It was A. Boiffin who in the middle "nineties" first clearly demonstrated, through J. Gourdet, a pupil, precisely why it is the posterior portion of the rib that must be removed. Gourdet's argument is as follows:

On account of the yielding rib cartilage the anterior part of a rib can be pressed inward, whilst the posterior portion is stiff and, practically speaking, immovably connected with the vertebral column, and in any case can only be moved up and down a little. Further, the posterior part of a rib exhibits a marked concavity forward, or, in other words, forms an arc the radius of which is much less than that of the arc of the rib otherwise; the angle of the rib forms the most prominent point in this arc behind. Any resection of the ribs which is situated in front of the angle of the scapula leaves behind a stiff, unyielding piece of rib, which in accordance with its length will prevent the soft parts from falling in and diminish the costovertebral angle. If, on the other hand, we remove the posterior stiff part of the ribs, the anterior part can very easily be turned about the costal cartilage and pressed in toward the thoracic cavity and backward toward the posterior fragment of rib, so that the entire arc of the rib decreases considerably in its curve and thereby also decreases the volume of the thorax. By this method the anterior part of the ribs is not hindered in its movements by the soft parts, which in other methods stretch over the projecting posterior end of the rib.

Which ribs, and how much of each rib, should be resected in order to be sure of obtaining the necessary effect?

Before replying to this question it is es-

sential to form a clear idea of the fact that the objects of extrapleural thoracoplasty lie in two directions, which, however, converge. One object is to produce collapse of the lung, the other is to put it out of function, the latter being in conformity with the general rule for the treatment of tuberculosis of bones and joints. But just as in the treatment of coxitis we do not hesitate to place a healthy knee into a plaster bandage, so also in thoracoplasty we may also allow the resection of ribs, even though only a portion of the lung is diseased, to extend beyond the diseased part, if we desire to prevent or at least considerably to reduce the respiratory excursions of the lung. The latter are dependent not only upon the movements of the thorax, but also upon those of the diaphragm. Our decision to go so far down, however, depends upon whether the diaphragm is immobilized and drawn up beforehand on account of extensive adhesions between the lung and the wall of the thorax on the one side and the lung and the diaphragm on the other. This condition can be ascertained by means of the Roentgen rays. For the depression of the wall of the thorax the resection of the eleventh rib would scarcely be of importance; but in addition to contributing toward the immobilization of the diaphragm it will possibly also facilitate its retraction upward in the thoracic cavity, when the lung tissue shrinks during healing. On the other hand, the tenth rib should always be resected even though the affection of the lung is restricted to the upper lobe; but the length of the piece resected will depend, both as regards the tenth and ninth ribs, upon whether the lower lobe is infected.

We can rely with tolerable certainty upon achieving this by resecting about 12 cm. of the tenth and ninth ribs and 15 cm. of the succeeding ribs up to the fourth. But of course due regard must be taken of individual cases. When there is pronounced disease in the upper lobe we must at all costs resect the second and first ribs.

The author applies local anesthesia for the soft parts, regional anesthesia of each intercostal nerve.

The incision commences, when operating in one stage, at the height of the spine of the scapula, about midway between the margin of the scapula and the spinous processes. If it is desired to remove the second rib it may be necessary to go a little higher up. However, the levator anguli scapulæ may very well be kept.

The incision is continued parallel to the spinous processes to the tenth rib, and then bends outward along the tenth or eleventh rib to the scapular line or a little farther. As the arm is drawn outward and upward, after cutting through the musculature, one can get right in under the scapula, and with the aid of broad retractors lift it away from the thoracic wall; there is then no difficulty connected with resection of as large pieces of rib as we wish. Resection begins from below, and not until the seventh or eighth rib is reached does the above-mentioned maneuver with the scapula become necessary.

After resection of the ribs yellowish-white nodules can, as a rule, be seen through the costal pleura, and by palpation hard nodules in the lung tissue can readily be felt, the size of a grain and upward to the size of a nut. The pleura is more or less thickened, but by no means so much so as we are accustomed to see in old empyemata. The musculature is sewn together with catgut, the skin with silk.

Resection of the two upper ribs is not always simple, especially when dealing with the first rib. This part of the operation can be considerably facilitated if, after resection of the fourth or third rib, we carefully cut through the periosteum and the endothoracic fascia, and then undertake a loosening of the apex of the lung, or regular apicolysis. The lung is thus removed from the ribs, and therefore no risk is run of its lesion during resection of the second and first ribs; in addition the apicolysis contributes *per se* toward further collapse of the lung. A glass drain 8 to 10 cm. long is placed in the posterior angle of the incision, and removed on the first or second day after the operation. In this manner healing undoubtedly proceeds more easily

and surely than with the tamponade previously employed.

Those who have performed these operations will know that cavities in the apex give the greatest difficulty in achieving an entirely satisfactory result. In these cases the momentary effect of thoracoplasty is often strikingly good, but sooner or later profuse expectoration and subfebrile periods may again appear, and the physical signs of a cavity again become more pronounced. Since January, 1917, the author has employed transplantation of fat in nine patients, in order to cause an obstinate cavity to collapse.

The fat is best taken from the abdomen by means of a large arc-shaped incision with the convex side outward. The skin with a quite thin layer of fat is dissected aside to a large extent, so that one can remove the subcutaneous fat with superficial fascia in one connected piece.

As far as the further fate of the transplanted fat is concerned Tuffier's investigations have shown that in aseptically healed cases it is converted into firm, fibroadipose tissue.

When operating in one stage the first part of the operation, until the sixth or fifth rib is reached, usually proceeds with normal pulse and respiration, but during the resection of the upper ribs both often increase considerably in frequency; the pulse may rise to 140-160 and the respiration to about 40. Shortly after the operation, and sometimes before its completion, the pulse often goes down to 110-120 and the respirations to 20-30. In some cases the pulse did not exceed 80-90 and the respirations 28-30, in spite of a large resection.

Narcotics must be given during the first days. It is of the greatest importance to get the patient to cough up the sputum; pain connected with coughing must therefore be prevented.

In the succeeding days there is often a rise in temperature, in favorable cases somewhat moderate, 37.4° to 38.5° C., lasting not more than four or five days. The pulse rises relatively more and remains at 110 to 120-130 for several days. In other

cases the temperature may rise above 39°, the pulse to 130-140, and yet primary healing of the wound may take place. In these cases both rise in temperature and high frequency of pulse are a result of pulmonary complications. High temperature up to 40° or above, and frequency of pulse 120-140, which shows no signs of descending in the following days, give an unsatisfactory prognosis.

In favorable cases the patient recovers quickly after the operation, appetite and weight increase, temperature falls to the normal, cough diminishes, and his improved subjective condition puts him in better spirits. Some patients even have a decided conviction that the disease has released its hold on them.

The author reports on 48 extrapleural thoracoplastic operations. In his first series three died immediately after operation. In his last series of 26 patients only one died. This betterment of the immediate mortality the author ascribes to operation in two stages. Three of the four deaths were due to infection. Seven patients died subsequently of tuberculosis, one four years after operation; one died of influenzal pneumonia. Twenty-five still live. Of these the author regards fifteen fit for work, always afebrile, and tubercle bacilli can no longer be demonstrated in the sputum. Ten gave symptoms of pulmonary tuberculosis.

Complications Observed in the Treatment of Angiomata with Radium.

NEWCOMET (*Urologic and Cutaneous Review*, October, 1920) states that in a list of over two hundred cases of angioma, of which about one-half were treated with radium, some unexpected complications have been observed. The majority of these complications might have been avoided, had one an insight into the future, yet some of them were to be expected in the natural course of consequences, and it was thought that a short review of them might be given with profit to all concerned in the employment of radium as a remedial agent.

It has long been recognized by the medi-

cal profession that moles and other forms of angiomas are often the focal spots for some malignant degeneration, and in the number of cases that came under observation four were seen where malignant degeneration had occurred. While this number would appear to be comparatively small, yet we must consider that about three-fourths of all the cases observed were children, and of the remaining one-fourth, many were young adults. Had a larger number of these cases reached a more advanced age, the probability is that more of them would have suffered from this change. In the four cases here cited it is not to be inferred that malignant change took place in advanced life: quite the contrary three developed sarcomas; one was a woman past thirty, and a man and a woman under that age; while another woman about forty-five developed an epithelioma. In the last instance a hemangioma was situated upon the left side of the face and extended into the hair in the temporal region.

Most of the lesions that come under observation are upon the exposed portions of the body, and the great majority are upon the face, therefore it is the cosmetic result that is usually desired. At times, however, the position of the lesion causes it to become an annoyance to the individual. If it should be located in the axilla, on the back, or in the groin, the clothing may irritate it, perspiration or the ordinary muscular movements may also have the same effect, and give rise to sufficient trauma to cause bleeding or at least a very offensive discharge.

These cases are usually easily treated, as the removal of the lesion is all that is desired, and scarring on these less exposed parts is not objectionable.

In these instances radium will give by far the best result in the average run of cases and may be easily applied. The removal of these lesions by a surgical procedure does not always accomplish the desired result, for it must be remembered that the vessels are not normal, and have a curious way of undergoing further dilatation when, for some reason, their circulation is impeded.

Occasionally disaster will follow the ap-

plication of radium, when, during the time the reaction is at its height, the patient develops some inflammatory condition of the skin, observed in one instance where measles was the complication, and in another erysipelas. The same effect is observed in very young children from rubbing of the affected part until the bruising causes it to ulcerate. It must be remembered that a certain amount of irritation is to be expected, and care must be taken to guard the part from trauma, while the reaction is at its height. Here again, if ulceration does occur under these circumstances, it is very liable to cause considerable scarring, and often the result is as disfiguring as the original lesion.

The greatest difficulty is presented when these lesions take on the character of a "port-wine stain" or a very flat pigmented mole over an extensive surface. These are the cases that usually result in failure and will develop ulcerations, telangiectasis and keloids upon the slightest degree of over-radiation.

There is not the least doubt that in radium we have found one of the greatest agents for the treatment of angiomas, and, with few exceptions, the results obtained will far surpass those of any other agent or method. Yet, as with all other remedies in medicine, judgment must be employed as to when and how to apply radium and whether some other agent might be used as an auxiliary, the object being to obtain the best result, with the least discomfort to the patient.

Virulent Diphtheria Bacilli Carried by Cats.

SIMMONS (*American Journal of the Medical Sciences*, October, 1920) contributes a laboratory study on this subject, based on an experience with an elderly lady who developed a fatal diphtheric pharyngitis after close contact with a cat which had been sick one week. Moreover, a second cat which had been in close contact with the first cat became sick and died ten days later.

The patient had a grayish-brown pseudo-membrane covering her uvula, tonsils, and posterior pharynx. The first cat had a small yellowish-grey pseudomembranous ulceration in the left nasal passage, and the second cat showed ulcerations of both vocal cords covered with a grayish-white false membrane. Diphtheria bacilli of intermediate virulence for guinea-pigs were isolated from all three lesions.

The X-Ray as an Essential Guide for Producing Artificial Pneumothorax in Advanced Cases of Pulmonary Tuberculosis.

KRUPP (*New York Medical Journal*, Oct. 30, 1920) observes that in advanced cases of pulmonary tuberculosis the almost constant harassing cough and frequent hemorrhages are the most difficult symptoms to treat. Narcotics and other methods are used to give relief, which is only temporary. With the production of an artificial pneumothorax the affected lung is collapsed and the annoying symptoms are more or less permanently relieved; certainly to a more marked extent than by the use of narcotics, and without their undesirable depressing effects. The purpose of the pneumothorax in these cases is not to produce a cure, primarily, but to render the patient's life more comfortable and possibly increase his chances for recovery. This relief from the harassing cough and pain will also have a favorable effect upon the morale of the patient, which is a matter of great importance in the treatment of pulmonary tuberculosis. The relief of his sufferings is what we strive for. In certain seemingly hopeless cases this treatment has caused an apparent arrestment of the disease. Three selected cases are cited in this article. Two of the advanced cases became ambulatory, after the patients had been bedridden for almost a year.

There are several important factors to be considered before a pneumothorax is tried, and the *x*-ray stands out as the essential guide to the clinician. Krupp calls attention to the aid of the fluoroscope, which is also

part of the guide. With the bedside unit, the hand fluoroscope is used to great advantage. The *x*-ray plates give the pathological findings as a permanent record, while the fluoroscope gives a clue as to the mobility of the chest and the excursion of the diaphragm of the affected side. The following points were studied before pneumothorax was produced: (1) The extent of the pathology, especially as to cavities. (2) Will the opposite lung be able to furnish sufficient pulmonary tissue after the affected lung has been collapsed without throwing additional risk to the patient? (3) Pleurisy and adhesions.

In the extent of the pathological involvement of the lungs, the *x*-ray stands out as the positive guide. Cavities will always show on the *x*-ray plate, whereas they may be missed by the most thorough physical examination; and in deciding the extent of the involvement, it has been found that the roentgenological studies are the final and deciding factor.

The question of the opposite lung being able to furnish sufficient pulmonary tissue to functionate after the affected lung has been collapsed is a serious problem to determine. In a case in which one lung is involved and the other lung normal, there is no question, of course, that this is the ideal treatment. But it is in those cases in which both lungs are heavily involved, and perhaps one somewhat less than the other, that the difficulty arises. A careful study of such cases is necessary, before any attempt is made to collapse the lung. Now what is the course to follow when such is the case and the patient needs relief from his sufferings? In all probability this patient is going to die. Therefore we must be governed by the following factors, namely: the cessation of the cough, with a less copious expectoration; control of the hemorrhages and lessening the toxemia, which outweigh the risk we take in throwing additional burden on the small amount of uninvolved lung tissue remaining.

Adhesions and fibrinous pleurisy associated with a pulmonary tuberculosis, as seen by the *x*-ray plate, is another factor to be

thoroughly considered, for one cannot attempt to collapse a lung that is firmly plastered to the parietal pleura.

Of the 453 *x*-ray examinations made in the last three months, forty-six were bedside examinations. The author also made use of the hand fluoroscope. The remaining cases were examined stereoscopically. With this large number of cases to choose from for the production of an artificial pneumothorax, the problem was less difficult.

Since it is in the hemorrhage cases that the most satisfactory results are obtained, it should nevertheless be borne in mind that it is in this class of cases that the greatest risk is also taken; for while it is usually possible to presume that the hemorrhage is from the side showing the greatest involvement, still it is possible to collapse a lung showing considerable involvement when the

hemorrhage might occasionally be from the lung showing the minor lesion. In these cases the *x*-ray plates have been showing small cavities in the region of the hilum of the lung that appears to be least involved. A few patients have come to the autopsy table, and on sectioning the lung the apex of the lower lobes and the middle lobe on the right side revealed very small cavities.

In a few cases fibrous bands of adhesions can be released by persistent frequent injections of air. If these bands are not too strong, the chances for collapsing the lungs are very good. The gradual tearing loose of these band-like adhesions can be beautifully studied by the radiographic examinations, as the treatments are continued. In the beginning one sees air pockets formed about the adhesions with gradual thinning out; finally the desired result, the complete separation and the collapse of the lung.

Reviews

REGIONAL ANESTHESIA. By B. Sherwood-Dunn, M.D. Illustrated. The F. A. Davis Company, Philadelphia, 1920. Price \$3.50.

Although the author of this book bears a very English name, he is nevertheless a surgeon in Paris. He points out that for thirty years Réclus of Paris originated and practiced local anesthesia, injecting the tissues with a weak solution of cocaine. Of course, thousands of other surgeons have done the same thing for many years, but the point of the author is that their methods are quite different from what he calls regional anesthesia, because instead of applying the anesthetic to the terminals of the nerves, it is injected at the point of the origin of the nerve or along the trunk near its point of origin, so that the whole region supplied by that nerve and its branches is anesthetized. He claims that all the minor and most of the major operations can be

performed in this way and that the growing popularity of the method has led him to produce this book. The author gives credit to Pauchet as the leading exponent of regional anesthesia in France, and states that much that he says represents Pauchet's views.

The book contains a little less than 300 pages and no less than 224 illustrations. The opening chapter deals with the advantages of regional anesthesia and its disadvantages; the second chapter deals with the syringes, needles, anesthetics, and general technique, and from here on the chapters discuss the employment of regional anesthesia in the head and neck, thorax and abdomen, pelvic organs and the extremities.

A point in which we think our readers will be particularly interested is the statement made by the author that as soon as

the concentrated solutions of cocaine had been replaced by weak solutions of less toxic agents, such as stovaine and novocaine, the deaths from regional anesthesia disappeared from surgical practice. Indeed he is unacquainted with a single case of death since the employment of these newer anesthetics. He states that death from ether has a ratio of one in 5000, which is a far higher ratio than is generally admitted in this country. He believes that by regional anesthesia there is a great reduction in post-operative dangers and thus there is a diminution of shock.

Amongst the disadvantages of regional anesthesia are the necessity of considerable training in its application, so that the author advises that he who intends to follow him should not only read this book, but practice upon the skeleton with needles of various lengths as to the best method of reaching the foramina from which nerves take their exit. A considerable degree of gentleness and skill in operative technique is also essential. To the objection that regional anesthesia often offers only a partial anesthesia, the author states that it has been his experience that out of 20 cases 12 are completely insensible, 7 are sufficiently sensible to permit of procedure without serious complaint, while one out of the 20 suffers enough to require a little ethyl chloride, an anesthetic which has not reached great popularity in this country.

He also states that before all operations the patients should be given morphine and scopolamine; in other words, his method of regional anesthesia is really a combination of twilight sleep and local anesthesia. The time necessary to induce anesthesia in the hands of an experienced assistant is ten to fifteen minutes.

The book is well printed and so heavily leaded that it is very easily read. It is a useful contribution to its subject, and while the advocates of all forms of anesthesia, other than that obtained by inhalation, are enthusiastic, we think the conclusion of the profession up to date is that the older anes-

thetics are usually to be preferred, but that the injection method of relieving pain is certainly indicated in certain types of cases.

PROGRESSIVE MEDICINE. Edited by H. A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume IV, December, 1920. Lea & Febiger, Philadelphia, 1920.

The present issue of *Progressive Medicine* contains a little over 400 pages, the articles being written by Dr. Edward H. Goodman of Philadelphia upon Diseases of the Digestive Tract and Allied Organs; another upon Diseases of the Kidneys, by Dr. Henry R. Geyelin of New York. Genito-Urinary Diseases are covered by Dr. Charles W. Bonney of Philadelphia, and more than 100 pages are devoted by Dr. Walter E. Lee of Philadelphia to the Surgery of the Extremities, Shock, Anesthesia, Infections, Fractures, Dislocations and Tumors; and last of all there is a practical therapeutic referendum by Dr. H. R. M. Landis.

It will be recalled that the object of *Progressive Medicine* is not alone to reprint the views expressed by various authors during the past twelve months, but to provide a critique so that the views of each author are, when it is deemed advisable, criticized or indorsed by the author who prepares the article. Or, in other words, each article is supposed to be a story of the advances made in that department of medicine during the past twelve months.

HEART AFFECTIONS: THEIR RECOGNITION AND TREATMENT. By S. Calvin Smith, M.S., M.D. Illustrated. The F. A. Davis Company, Philadelphia, 1920. Price \$5.50.

The author of this book of a little more than 400 pages makes his contribution to medical literature because he states that contact with medical men in civil life has taught him the need of a fundamental volume on the heart. He has divided his subject into twenty-five chapters, and has evidently taken much pains in the preparation of his text. A very attractive part of the book is its large type with heavy leading, which makes it easily read. It is evident

that Dr. Smith's experience in the army gave him many facts which he is glad to include in his volume. No attempt is made by the author to quote current cardiovascular literature *in extenso*.

We believe that many practitioners will find much useful and practical information by perusing the pages of this volume.

MEDICAL CLINICS OF NORTH AMERICA, for November, 1920. W. B. Saunders Company, Philadelphia, 1920.

It will be recalled that this publisher issues six numbers a year of the Medical Clinics of North America, for which the subscription price is \$12. This is Number 3 of Volume IV and is called the St. Louis number, as the contributors to its pages are practitioners in that city. The volume opens with a clinic by Dr. George Dock upon Focal Infections and Arthritis, and then proceeds to present nineteen other reports of clinics by the same number of clinicians. These clinics deal with the realm of medical practice from the basal metabolic rate in endocrine disturbance to Paget's disease of the bones, and paroxysmal tachycardia.

THE PRINCIPLES AND PRACTICE OF INFANT FEEDING. By Julius H. Hess, M.D. Illustrated. Second edition. The F. A. Davis Company, Philadelphia, 1920. Price \$2.50.

Dr. Hess is head and Professor in the Department of Pediatrics in the Medical College of the University of Illinois. He has added another volume to the literature on infant feeding because he believes that he has ideas which he can put forward in such a way as to prove of practical interest and value to his fellow practitioners. That infant feeding is, of course, an infinitely important problem is admitted by every one. The author makes the striking statement that the mortality of the first year is nearly sixty times that of the fifteenth year, and it is not until we approach the eighty-fifth year of life that we meet with such a high percentage of death-rate, and most of the early mortality depends upon digestive disturbance.

The book has a preliminary chapter upon the physiology of the digestive tract, upon maternal and wet nursing, artificial feeding, and then a series of chapters upon nutritional disturbances and upon artificially fed infants, with an appendix, in which much valuable information is given as to how a young child is to be taken care of in connection with bathing, washing out the stomach, the use of the mustard bath, and notable aggregations of practical clinical points which ought to prove most valuable. The book contains a large amount of information in concentrated form and is to be recommended to men in general practice as a reliable guide.

THE SYSTEMATIC TREATMENT OF GONORRHEA IN THE MALE. By Norman Lumb, O.B.E. Second Edition. Lea & Febiger, Philadelphia and New York, 1920. Price \$1.75.

This manual observes that the methods of diagnosis have been improved by the introduction of valuable media for the cultivation of the gonococcus; and the complement-fixation test, although still in the experimental stage, seems likely to become a reliable guide in diagnosis and treatment.

In confirmation of the author's word, vaccines have come to be widely used in the acute stage of gonorrhea and detoxicated vaccines are on their trial. He hopes this book will be of use not only to those called upon to assist in the numerous centers now established, but also to students completing the course of clinical instruction. A somewhat sketchy résumé of gonorrhea, its course and symptoms is given; a cursory review of the pathology and bacteriology of the infection, brief, but for the work adequate. A chapter on Examination of the Urine and of the Prostate. The author then considers what he calls Routine Treatment. He advises 2 to 4 pints of barley water every day and states it may be made a palatable drink by the addition of lemon. He cautions against spices, pickles and highly seasoned food. He advises exercises every day, and holds by the tenth day an uncomplicated case of gonorrhea should

be eating a full diet and going about as usual. He believes that urotropin is a useful drug, noting that in some patients it causes irritability of the bladder. Complete irrigation, of hot 1:8000 permanganate twice daily, is advocated. It is omitted in the presence of acute epididymitis or when the inflammation is hyperacute. Zinc may be useful toward the end of treatment.

The mixed stock vaccine gives the most satisfactory results. Following on the injection there is a negative phase, lasting from twenty-four to forty-eight hours, according to the dose and toxicity of the vaccine employed, during which the power of the blood seems to be diminished, followed by a rise in its hostility to the organisms, known as the positive phase, lasting longer than the negative phase. One positive phase can be superimposed upon another by giving injections at suitable intervals and regulating the dose carefully. Vaccine treatment, the author states, causes the speedy disappearance of pain on micturition, lessens the liability to complications, and is a sound test of cure.

The author goes into the question of detoxicating vaccine, the toxin being an endotoxin. He speaks of the electrochemical treatment of gonorrhea and mercury compounds in the management of this disease. Thereafter complications are gone over and their proper treatment.

A short, well-expressed manual, worth the student's and young practitioner's attention.

Correspondence

An Unusual Cause of Lead Poisoning.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: A wood-chopper living on the bank of a Southern river, when seen by me was so paralyzed that he could scarcely move an arm or leg. The cause was puzzling, but on inquiring as to the condition of his bowels, his reply was that they were constipated, and when first stricken he had severe colic. This gave a clue to the cause, and on examining his teeth the blue line of lead poisoning was seen, making a diagnosis certain. The question then arose, where did he get the lead? Inquiring if he had recently taken any medicine, he said he had taken medicine for hematuria, but had none of it left. Asked to describe it, he said it was a milky-looking solution, which indicated it was the acetate of lead. He recovered quickly under doses of potassium iodide. Some months later I met the physician who had attended this man, and he told me he had given him the acetate of lead for the hematuria.

ARTHUR A. RADCLIFFE, M.D.

WAUKEGAN, ILL.



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Original Articles

Indications for the Treatment of Acute Appendicitis, from the Standpoint of the Surgeon

BY MOSES BEHREND, M.D.

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Notwithstanding the voluminous literature collected since appendicitis became a distinct entity, the surgeon still meets too many advanced cases where pus and gangrene of the appendix are present. Despite all the educational propaganda among the laymen, there still is too little realization of the fact that appendicitis is a dangerous disease. The freezing of the appendix is still deeply rooted in the minds of the laity—in fact a physician is often not called because, the diagnosis being easy, the ever-ready ice-bag is applied, much to the detriment of the patient. The ice-bag is followed in many instances by the ice-box. Although the intensive educational propaganda of the surgeon ought to be heeded, the physician often errs in not referring his patient early enough to the surgeon; instead he still resorts to morphine and purgation. While these infractions are not as numerous as they have been, still, in recent discussions of the subject, various physicians admitted that they prescribe morphine for pain in appendicitis. Purgation does not seem to be nearly as detrimental as morphine on account of the masked symptoms the latter produces. The purge intensifies the pain, necessitating earlier surgical interference.

A factor which has seemingly minimized the necessity for operation is the idea that victims of first attacks of appendicitis al-

ways get well. While this is true in a measure it has worked to the detriment of the patient because the physician and patient have developed a false sense of security that the patient will get well without an operation. Many pus cases can be attributed to the desire to wait for symptoms to subside and avoid operation. While it is admitted that many recover from first attacks, it is just as pertinent to remember that an interval operation is the ideal one for an appendectomy. It ought to be an axiom that a second attack should be avoided, but if a second attack should occur an immediate operation should be performed.

Realizing then that acute appendicitis is a dangerous and fatal affection if not operated upon, a consideration of the various types may be interesting. It is difficult to believe that a patient in perfect health may have a fulminating appendicitis in a few hours, but such a case came under my notice a few days ago. A man perfectly well on Christmas day was awakened suddenly at 6 A.M. Sunday morning with severe pain in the abdomen. Dr. Eshner saw him at 6:30, and at 8 A.M. I confirmed the diagnosis of appendicitis. About 10 A.M. the operation was completed. We found the appendix swollen, engorged, and full of pus. Strange as it may seem, pus in considerable quantity had been formed in less

than four hours, in a man who never had a symptom of any kind referable to the gastrointestinal tract. In most cases, however, there is a history of previous slight attacks. When the resistance is lowered pus formation goes on rapidly. This type of case seems to be particularly prevalent in children, for which occurrence no satisfactory explanation has been given. From this very rapid type there exist, then, all grades of inflammation, including an appendix containing pus bound by adhesions to the cecum, an appendix bound down to the omentum lying in a pool of pus, the free gangrenous appendix much dilated, dark in color, and almost ready to burst, the appendix ruptured, which has caused an abscess in the pelvis along the cecum and around the liver, and then those neglected cases in which there is general suppurative peritonitis for which little or nothing can be done. The appendix may be located in any part of the abdomen, giving rise to symptoms simulating any intra-abdominal condition. The appendix has been found deep in the pelvis attached to the sigmoid and urinary bladder, and as high as the lesser peritoneal cavity between the liver and stomach. Again the appendix has been found at all levels between these two extremes ante- and post-cecal. A left-sided appendix is not unknown, but usually this means that the tip of the appendix is in or near the left iliac fossa.

When the appendix is high it is most important to differentiate it from gall-bladder disease, acute pancreatitis, and perforation of a gastric or duodenal ulcer. When the appendix is low it must be differentiated from stone in the ureter and gynecological conditions.

The clear-cut symptoms of pain followed by vomiting and rigidity in the right iliac fossa cannot be mistaken for anything else. The same may be said of acute cholelithiasis when the pain is in the right upper quadrant, usually coming on in the early hours of the morning and requiring a hypodermic of morphine to control the pain. The attack may or may not be followed by

jaundice, but when the latter does occur it is good confirmatory evidence of gallstones. Appendicitis may be mistaken for gall-bladder disease when the appendix is high, encroaching on the gall-bladder.

Acute pancreatitis is difficult to diagnose, the pain being usually in the epigastric region or to the left of the median line. The pain is very severe, requiring several hypodermics of morphine to relieve the patient. Vomiting follows, and there is great prostration following these attacks.

Before a gastric or duodenal ulcer perforates there is a previous history of indigestion which has existed for a long time. The perforation occurs, the pain, which is intense, beginning in the upper abdomen and rapidly spreading to the entire abdomen, followed quickly by a board-like rigidity.

Many cases have been operated on for acute appendicitis when actually a stone in the ureter was present. This is determined later when the symptoms return; an x-ray is taken, which reveals the true diagnosis. I have operated on two cases which illustrate this point. The differentiation from gynecological conditions will no doubt be discussed by the speaker to whom this subject has been allotted.

No one will depend on a leucocyte count to make a diagnosis of appendicitis. It is a well-established fact that the leucocyte count confirms the presence of an inflammatory condition in the abdomen. Greater dependence must be placed on the physical signs than upon the leucocyte count. When the leucocytosis is low a high polymorphonuclear count gives an index as to the degree of inflammation present.

The only treatment for acute appendicitis is immediate operation. There may be some exceptions, depending on one's ability to be able to diagnose the degree of inflammation. This can readily be done by palpation; the ends of one's fingers can be educated to discern, so to speak, the progress of the disease. One might call it intuition, but it is necessary to support your analysis of the case with a large experience in the diagnosis of this condition. The ability to tell the de-

gree of inflammation is especially useful in those cases that we see at the end of our day's work, cases that have been studied a little too long. In some of these there is no objection to order "nothing by mouth, Fowler position, and the Murphy drip." Cases so selected for operation are in better condition in the morning than they were the previous night, because invariably the treatment has reduced the inflammatory process. In my early practice I operated on these cases all hours of the night and day, but there is no question in my mind that there are many cases that do not require operation at once. This is not the Ochsner treatment, which will be discussed later.

Pus cases may be encountered illustrating all varieties mentioned previously, and upon these depend our course of procedure as to the type of incision, drainage, and so on. A good rule in all pus cases is that there must be deep anesthesia to prevent peristalsis, and the forcing of the intestines through the incision must be prevented. Next in importance is a quick operation; the average time consumed in a pus case ought not to be more than fifteen minutes. It is obvious that a midline incision should not be made on account of the spread of the infection to the general peritoneal cavity. A loin incision is of the greatest importance when the pus is localized and a distinct mass is felt. The appendix in this case is found either post-cecal or lateral to the cecum. Drainage is used in all cases in which there is free pus in the abdomen, and in the very severe cases the wound is sewn with through-and-through sutures of silkworm-gut. No attempt is made at tier suturing; the wound, in other words, is left open, just enough sutures being used to prevent extrusion of the intestines.

A great deal has been said and written about leaving the appendix in some pus cases. It has been my rule to remove the appendix in every instance, with beneficial results. There is no doubt that it is better to remove the appendix in all cases provided the proper incision has been selected and the abdominal pads have been placed properly to prevent the spread of infection. It

is essential in all these cases to get in and out as quickly as possible.

The greatest difference of opinion exists among surgeons as to the proper method of handling a case in which we believe there is a spreading peritonitis. There are two opinions: those who believe in waiting several days until the pus becomes localized, and those who believe in immediate operation on every case. There is no question that considerable confusion has been created in the mind of the general practitioner by those who advocate the Ochsner treatment. No doubt the habit of treating cases too long has been in a measure due to the physician's hazy conception of what the Ochsner treatment means. The Ochsner treatment should not be used unless the physician has considerable practical experience in classifying the different types and the different stages in which he finds the appendix.

There does not seem to be any question that the longer the products of inflammation remain the greater will be the pathology and consequently the more difficult will be the operation. The complications such as fecal fistula and intestinal obstruction will also be more frequent. It has been our custom not to use the Ochsner treatment, but to operate on all our cases immediately with the exceptions noted above. Our mortality of about one per cent compares favorably with those who use the Ochsner treatment.

In conclusion, greater care should be exercised by the general practitioner in referring his cases earlier to the surgeon.

This will reduce the number of drainage cases, which later are nearly always followed by an incisional hernia.

Some types of acute appendicitis ought to be operated on at once.

Others are benefited by a rest of a few hours by instituting the Fowler-Murphy treatment.

Children should be operated on at once on account of the peculiarity of the appendix to undergo rapid inflammatory changes.

The ability to diagnose the position and degree of inflammation depends solely on one's experience.

While the value of the leucocyte count is not underestimated, the diagnosis of acute appendicitis is determined by physical examination. A leucocytosis is simply confirmatory evidence.

In all pus cases one must get in and out as quickly as possible. Deep anesthesia is important.

The appendix is removed in every case. The Ochsner treatment is no doubt valuable in the hands of those who understand its application.

The writer never uses the Ochsner treatment. A mortality of less than one per cent compares favorably with the results of surgeons who advocate this treatment.

Chlorine as a Therapeutic Agent

BY M. B. HALLDORSON, M.D.

Winnipeg, Canada.

In May, 1916, the writer of the following lines read a paper before the North Dakota Medical Society with the above title, and where the use of chlorine solution was recommended in certain conditions, especially in the treatment of pneumonia and tuberculosis. This paper was published in *The Journal-Lancet*, October 15, 1916, an extract appearing in the THERAPEUTIC GAZETTE of January 15, 1917. February 15, 1919, there appeared in the THERAPEUTIC GAZETTE another article from the same source entitled "Chlorine in the Treatment of Pneumonia," reporting seventy-two cases of pneumonia with one death, but otherwise perfect results—i.e., "complete recovery regardless of complications"—and giving a detailed account of how chlorine solution should be made and dispensed in order to give the best results.

As far as the writer knows (with the exception of a very few inquiries) these articles were, if read at all, promptly forgotten. This could be expected. A paper which, contrary to the accepted ideas, advocated a drug in the treatment of pneumonia and tuberculosis of the lungs would naturally be passed up as a freak idea or a plain folly, probably both. It is, however, to reiterate what I have already said about chlorine and to give further evidence of its value as a remedy in diseases of the lungs that these lines are written.

First, as to pneumonia. Shortly after the

article on "Chlorine in the Treatment of Pneumonia" was written, which was in September, 1918, the influenza epidemic broke out. I was then somewhat at sea, wondering whether or not chlorine would be of value in pneumonia complicating influenza as well as in ordinary pneumonia cases. Consequently I treated the influenza on general principles, keeping a sharp lookout for lung consolidation, and when pneumonia appeared, prescribed chlorine. This I kept up during the first three weeks of the epidemic with satisfactory results, excepting that I lost one case of pneumonia, which I think I could have saved had I prescribed chlorine in the beginning of the disease before extensive lung consolidation had taken place. I then began to prescribe chlorine in all cases of influenza, whether or not pneumonia had appeared, with the result that I have had but one more death from influenza since, when chlorine was given before the lungs were involved. I had six more influenza pneumonia patients die between November 1, 1918, and April 1, 1919, but in all these both lungs were involved before I saw the patient and all had the virulent hemorrhagic form. Since April 1, 1919, I have had no deaths from pneumonia.

Altogether one hundred and eighty-five cases of pneumonia have been treated by this method since November 1, 1918 (I have kept no account of influenza cases where

the lungs showed no signs of consolidation), with eight deaths, or 4.9 per cent. When it is considered that this was in the same place and at the same time that local hospitals had been losing 50 per cent and over of their pneumonia cases (and then had done as well as the average), the difference in results can easily be seen. I have noted this difference, however, between influenza pneumonia and the ordinary lobar pneumonia: that while chlorine can be expected to be of value at almost any stage of the latter, in the case of the former it is usually useless in the later or last stages. This is as would be expected, since the pneumococcus is only an attenuated strain of the more destructive streptococcus. The only safe way with influenza is to give chlorine from the start, for if pneumonia then appears the chances are it will run a mild course and without complications. At least this has been my experience so far, for out of these one hundred and eighty-five cases I have had no complications outside of throat and middle-ear trouble, excepting one case of empyema in a Christian Scientist who refused all medical treatment for a week from the time she became ill. Six of these cases were pregnant women; the seventh developed pneumonia in childbed. Five of the former became very ill, but all recovered, although one aborted. One had a rather mild attack. The childbed case also recovered after a hard struggle.

These one hundred and eighty-five cases with eight deaths, together with the seventy-two pneumonia cases previously reported, with one death, give a total of two hundred and fifty-seven cases with nine deaths—a death-rate of 3.5 per cent, 4.9 per cent for the influenza pneumonia and 1.4 per cent for lobar pneumonia.

It would seem that a death-rate of only a small fraction of what could ordinarily be expected in over two hundred and fifty cases of any disease ought to prove the value of the treatment employed, sufficient to make it worth using without any further evidence. But when it is also considered that chlorine is not a drug in the ordinary

sense of the word, but one of the most important substances that go to make up the human body—the most active one at that—since its principal salt forms a large part of the blood plasma, its acid a very important ingredient of the gastric juice, and that in the form of normal salt solution it is used every day in surgery to combat acute infections, it would seem only reasonable to presume that it is valuable in medicine. The fact is, what normal saline is to surgery, chlorine is to medicine, at least as far as combating the streptococcus (including the pneumococcus) and the bacillus tuberculosis is concerned. Neither one is a cure-all, but both are very valuable. My first attempt at using chlorine in pneumonia was by giving normal saline hypodermically in a desperate case. It brought on crisis and saved the patient, and for the ten years following, 1904 to 1914, I used to leave salt tablets with my pneumonia patient with directions to dissolve them in the water the patient drank. I lost one adult and one child from pneumonia during these ten years. But I kept no account of the cases, so cannot give the death-rate. But it is an interesting fact, and shows how slow and stupid a man may be, that although I began to use chlorine for tuberculosis as early as August, 1906, it took me eight years to catch on to the use of it for pneumonia.

Second, as to tuberculosis. As just stated I have used chlorine for tuberculosis infection since August, 1906: I tried it at first as a last resort in a case of far-advanced pulmonary tuberculosis and got unmistakable results. This patient, in spite of a life of work, want, and worry, lived for three years and seven months after treatment was commenced.

Since then I have treated, all told, fully four hundred cases of pulmonary tuberculosis, ranging in severity from "borderland" or "pretubercular" cases without any definite physical signs, but with the ordinary symptoms of oncoming lung trouble, to those in the very last stages of pulmonary consumption, with so uniform and gratifying results that the use of

chlorine in tuberculosis is no longer an experiment with me but an established treatment, where I expect definite results under given conditions, as one would expect from the use of mercury in syphilis, salicylates in rheumatism, and quinine in malaria. Thus I know when a patient comes to me in the "pretubercular" stage (which is a topsy-turvy term, for that is really the purely tubercular stage, before any mixed infection sets in), or even in the incipient stage, that patient is going to get well without going away from home or giving up his work. In the second or moderately far-advanced stage he will have to give up all work, take regulated rest and exercise, and probably go to bed for a while. In the third stage any treatment, including chlorine, is apt to fail (though I must say in all fairness that some of the results I have had even in that stage have been exceedingly gratifying) as far as improvement is concerned: for the reason that here the lung tissue has often so far been destroyed that insufficient amount remains to supply the necessary amount of oxygen to the body, and because of the involvement of other organs, such as the kidneys, larynx, bowels, and Fallopian tubes. Failure here means that the patient does not recover; not that the drug proves altogether useless, for such cases are the rarest exception. I cannot count ten cases in all my experience in which chlorine proved of no value whatever.

I have been doing this absolutely without the aid of an institution of any kind, for the reason that I was anxious to find out and to be able to show what an average physician can do with tuberculosis if properly instructed; because it is the average physician, the family physician, who must solve the tuberculosis problem if it is ever solved. It is to him that the patient goes first and last—before he is sent to an institution, and when he comes back again—and it is very often on him, his ability to diagnose early, and the efficacy of his treatment, that the life of the patient depends. It is well known how pulmonary tubercu-

losis usually comes on, slowly and insidiously, with malaise, loss of appetite and weight, a cough perhaps, but always with afternoon temperature, which I believe is the surest sign of oncoming lung trouble we have. In a multitude of cases in which a patient with the above symptoms fails to improve under ordinary treatment the physician suspects pulmonary tuberculosis, but hesitates to express his fears and thus subject his patient to all the fuss, expense, and inconvenience that goes with being sent away from home for treatment, let alone being branded as a "T. B." case. For this reason he goes on hoping that the patient will take a turn for the better, until he is forced to make the truth known, often after the patient's vitality is so far undermined that he goes on to his grave in spite of any treatment.

All this is very human and perfectly natural, and it will always be so until "there is something for it"—some remedy which the physician can prescribe for these patients and which can be relied on to bring on improvement, or at least retard the process of destruction going on in his lungs. This remedy we have in chlorine, have always had if we had only known it. This will sound as a bold statement, but it is based on sixteen years' experience with fully four hundred patients. In all that time I have never seen a patient fail to improve and get better, no matter how acute the case, if treatment was begun before extensive destruction had started in the lungs. And with the exception of two cases following profuse hemorrhages and one following influenza, I have never witnessed that rapid wasting which may be seen anywhere both in and outside the sanatoria, in which a well-nourished body is reduced to a skeleton in a few weeks, while the lungs literally melt away.

This is not saying that all a physician needs to do in a case of pulmonary tuberculosis is to prescribe chlorine and sit back and watch the patient get better. It often is in border-land cases—*i.e.*, before destruction of the lung parenchyma has taken

place. But on the whole it must be said that chlorine is not a substitute for but an addition to the modern treatment of tuberculosis. But so valuable an addition is it that no patient who dies of lung tuberculosis has had a proper chance for his life unless it has been employed. There is no doubt that better results than I have had can be obtained in a hospital or sanatorium (for the difficulties of treatment in the home are often great) by adding the chlorine treatment to the ordinary régime. That goes without saying. I am here stating only what an ordinary physician can do in the course of his practice. The other I have still to find out, and I will do so as soon as I can attach myself to some institution of that kind. Treating without an institution has the great disadvantage that it is impossible to give exact figures, but it has the distinct advantages of getting the patients at the beginning of their illness, and that one can watch over them indefinitely if necessary, which is often impossible after they leave an institution.

Chlorine bears the same relation to tuberculosis as mercury does to syphilis. Both are valuable in the first stages, but equally inefficacious in the last stages. A great deal of the value of chlorine lies in its protection of the lungs, *i.e.*, its antitubercular influence, and that it may be used in any case of common cold or bronchitis which will not yield to the ordinary mode of treatment. A common cold may be kept up by a chronic infection anywhere along the respiratory tract, such as a tooth abscess, infected tonsils, chronic nasal trouble, and last, but not least, infected bronchial glands. This last source is the most treacherous because it is the hardest to get at, yet at the same time the source of nearly all chronic lung disease; therefore, if neglected, fraught with the gravest consequences.

It is very important to remember that the source of the majority of chronic lung disease cases is the bronchial gland, and that the disease spreads or makes its way from this source to the lung parenchyma along the lymphatics surrounding the bronchial

tubes, causing peribronchial thickening. This is why the ordinary classification of lung tuberculosis is so unsatisfactory. It is like inspecting the branches and leaves of a tree while forgetting all about its trunk and roots. And for this same reason the examination of lungs without an x -ray plate is never complete, for the bronchial gland infection and peribronchial thickening give no physical signs excepting slight dulness on percussion, which is usually overlooked.

As long as tuberculosis is confined to the lymphatic system, where it always begins, it is easy to control, excepting in the rare instances where a broken-down gland attaches itself to a large lymphatic vessel or a vein and suddenly floods the system with toxins as in acute phthisis. It may or may not give definite symptoms, but if progressing the patient's health is being undermined, and sooner or later, unless the process be stopped, the patient will become a consumptive. Thousands upon thousands pass through this stage every year, being treated for the principal symptom—cough, indigestion, loss of strength and weight, insomnia, anemia, or whatever the symptom may be—and in spite of the fact that universal tuberculous infection is now conceded and any one may be considered a possible case, end up as consumptives because the physician in charge failed to see beyond the symptoms he was treating. Or as stated above, he realized what was going on but hesitated to subject his patient to all the odium and expense which goes with being a tuberculous patient, and, as also stated above, he will keep on doing this until he has a remedy at hand which he can prescribe and get results.

In these cases, whether or not physical signs of lung involvement can be found, but where symptoms and the x -ray plate show oncoming lung trouble, chlorine is exceedingly useful. It is always perfectly harmless, the only discomfort it may cause being a slight irritability of the stomach when given in too large doses, and it is surprising how often the patient will report feeling better in a week or so, and will

simply keep on improving without more ado until he has fully recovered. Of course it cannot be predicted how long it will take; that depends on conditions which will always have to be more or less guessed at. But the important part is that he recovers. It is very important to treat promptly without waiting for physical signs, for physical signs mean lung involvement, *i.e.*, involvement of lung parenchyma, and that again means destruction of the part involved. For there is no such a thing as restoration of function to a lung area once invaded by tuberculosis. That part is gone as far as function is concerned, and the best that can be obtained by any treatment is a scar, a patch of fibrous tissue holding as prisoners a number of living, more or less virulent bacilli, ready to break away and make trouble any time the vigilance of the watchman, whoever he may be, is relaxed. For this reason tuberculous patients, no matter how well they recover, must be watched forever after, must be taught what their exact condition is, that their trouble in the same or a different form may return at any time, and that eternal vigilance is their price of good health.

What I have been saying above applies in the same way or even more so to children. I am perfectly satisfied that it is possible to take any number of children in ordinary health, and by properly watching over them keep them indefinitely free from destructive tuberculosis. In children, tuberculosis is always confined to the lymphatic system to begin with, and any attempt to spread to other parts of the system is met by a strong reaction. I feel satisfied that a great many more or less prolonged fever spells which so many children are subject to, and where the cause cannot be found, are really due to sudden escape of toxin from an infected gland which may or may not lead to the starting up of trouble elsewhere if left alone, but which if taken care of will go no further. I base this statement on the fact that since I began to use chlorine as a tonic, as well as for certain types of fever in children, which was in 1910, I

have not seen a case of any form of tuberculosis develop in a child while under my care.

DOSAGE AND METHOD OF PREPARING.

There is but one form of chlorine that can be used in medicine (outside of inhaling the gas, which I have never found of much use); this is the watery solution. I have been using a solution made as follows:

Sod. chlorate, gr. xl;
Acid. hydrochlor., f3iij;
Aque destillatæ, f3xvj.

Place the sodium chlorate freshly ground in a quart bottle preferably with a glass stopper, add to this the hydrochloric acid, and let stand without heating for a minute or two until the salt is fairly well dissolved; then remove stopper carefully and at arm's length and add about an ounce of water. Now shake vigorously. Keep on alternately adding water and shaking until there are sixteen ounces in the bottle.

When large quantities are needed chlorine solution may be made by charging distilled water from gas cylinders. But for small quantities the above method will answer the purpose.

If properly made chlorine solution should have a rich olive-green color and strong chlorine odor. *Care must be taken that the chemicals combine properly or the solution will contain free hydrochloric acid*, giving an unpleasant acid taste to the mixture. Whenever chlorine solution is used in a mixture it should be put in last, the other ingredients being well shaken up before it is added.

Chlorine solution may be given in doses of two to four teaspoonfuls in a tumblerful of milk or buttermilk as often as indicated. It is the best form to use in acute tuberculosis. But on account of its disagreeable taste and odor it ordinarily has to be combined with a vehicle of some kind. Because of its extreme activity very few substances will combine with it properly. As a matter of fact the only satisfactory vehicles I have found so far are the lighter extracts of cod-liver oil, especially those made by Parke, Davis & Co. (Palatol) or Frosst of Montreal (Elix. Gaduine Co.).

The heavier extracts throw down a precipitate when combined with chlorine solution and so do all other substances I have so far tried. I use the name "Palatol" or "Elix. Gad. Co." so that there can be no mistake about what is meant. Formerly I would simply put down "Extr. Ol. Morrh.," and some druggists instead of using the extract of cod-liver oil would put in the emulsion of cod-liver oil, which with chlorine makes a most horrible mixture, unpalatable and undigestible. For this reason I now write my prescription as follows:

℞ Sol. chlori,
Palatol or Elix. Gaduinæ, ää f̄jiv.
Sig.: Dose as given below.

Nearly every druggist when given this prescription will have to be taught how to put it up, and usually will have to be watched until he has become fairly well accustomed to compounding it. In preparing chlorine solution, either sodium or potassium chlorate may be used, but the sodium salt seems to dissolve better with hydrochloric acid and to make a better solution.

The dose in pneumonia is half an ounce of the above mixture every three hours until crisis comes. Then it may be given before meals and at bedtime as long as it seems to be agreeing with the patient, or as long as the attending physician deems its use necessary. To children under six years a teaspoonful may be given, and to those between six and twelve, two teaspoonfuls. Larger doses produce no ill effects. I have seen a two-year-old child drink as much as four ounces of the mixture with impunity, but larger doses than here given are apt to produce stomach irritation with loss of appetite when long continued, which disappears as soon as the drug is discontinued.

In acute tuberculosis and influenza the dose is the same as in pneumonia. In chronic tuberculosis a tablespoonful of the same mixture may be given before meals and at bedtime, and this kept up as long as the patient's appetite remains good, or until stomach irritation is produced, when it may

be discontinued for a week or so and then given again in somewhat smaller doses. In very mild cases the quantity of chlorine solution may be reduced to 3 ounces to 5 of the vehicle. Thin people unless they are putting on weight will have to be watched very closely. The hyperacidity will promptly disappear if alkaline salts, as soda bicarbonate, are given.

The effect of chlorine seems to be purely systemic, and I have learned to look upon it as a plain neutralizer of toxins. For this reason its effect varies greatly in "open" cases with mixed infections in accordance with the difference in toxins produced by different germs. In very chronic cases with few systemic symptoms, extensive lung destruction, and few if any tuberculous bacilli in the sputum, it is often of little value, and the same may be said of tubercular joint trouble after the bone has become involved. Again, it may be depended on in all forms of serous membrane involvement, synovitis, peritonitis, pleuritis, and even to a limited extent in meningitis. But dealing with lung tuberculosis it must never be forgotten that once the disease has advanced to such extent that insufficient amount remains to carry on proper oxygenation of the blood, all remedies fail. For it is no more possible to run a human body without lungs than a car without a carburetor.

CONCLUSIONS.

1. Chlorine in the form given above is one of the most useful drugs of the entire Pharmacopœia. It is of value in the treatment of practically all medical diseases of the lungs and respiratory tract, common colds, bronchitis, pneumonia, influenza, and tuberculosis; in children and adults alike. It is indicated wherever these diseases are treated in sanatoria, city clinics, hospital wards, and private practice.

2. It positively must be properly understood and prepared to give the best results.

The Aims and Duties of the Student¹

BY HOBART AMORY HARE, M.D.

Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia

It has fallen to my lot as the senior member of the Faculty in point of service, but by no means the senior in point of years, to welcome the old boys back to the halls and wards with which they are familiar, and to say to the new boys that they are equally welcome and will soon be made to feel at home in the somewhat large but nevertheless very friendly Jefferson family.

The custom of an introductory lecture has been in existence for the ninety-six years that the College has existed, and this custom probably will continue to exist because it affords the Faculty an opportunity to meet with the entire student body at the beginning of each year, a meeting which does not take place throughout the course or even at the time of graduation. Again, this excellent custom will persist because it affords the College authorities an opportunity to place before the student body certain facts which it should understand, and finally because it is an example of the team work which is essential to success.

In the first place it is essential that every student shall understand that he must place himself in a receptive state of mind. Some students I have known have seemed to think that it is the duty of an instructor to drive ideas into the head with a hammer, or, by means of some trephine, bore an opening through the calvarium and force knowledge in. Nothing can be more erroneous than this idea, because teaching, like water and electricity, always goes in the direction of least resistance, and as there are many students avid for instruction they receive the energy of the teacher and thrive accordingly. Whether it be babies in an orphan asylum, prisoners in a jail, boys in school, or students in the sciences, it is inevitable that the individuals who take readily what is

coming to them thrive best. Let me assure you that nothing is more discouraging to a teacher than to have to lead a horse to water and then try to make him drink, and nothing is so encouraging as to deal with thoroughbreds, which are always willing even if they are not clever.

Again let me say to you that students in the past have oftentimes developed the extraordinary idea that the various subjects which they have to learn are erected like hurdles, or obstructions, between them and the degree they covet. They train to jump these hurdles, and having succeeded, pay no more heed to them than if they had been actual hurdles. Occasionally they trip on one hurdle and have to go back and try again. This in school parlance is called a "condition"—why I do not quite know, for from a horseman's point of view the horse is "out of condition," and from the faculty point of view the man is in a *sad* condition. When he fails to go over several hurdles he is disqualified and has to repeat all the jumps. Now I can tell you a very remarkable fact; to wit, that it is surprising how many men, who fail to clear one or all the hurdles, wake up to the fact that it is their own fault, not for lack of brains, but because they have been lazy or wilfully non-receptive, and I have had men weep with disappointment when "thrown" who have told me in later life that they actually thanked me in their hearts for having waked them up to their duty so that they have achieved success.

Pursuing this same theme, namely, that students often think of the course and their instructors as impediments put in their way, let me tell you that the curriculum has been built as a stone house is built, by master masons. Years of experience have taught your teachers that certain things must be learned or acquired in definite order so that

¹Part of an address delivered on the opening of the ninety-sixth course of the Jefferson Medical College.

other things may be comprehended and learned. The process of teaching is a process of construction, and so let me urge you not only to regard each branch as you tackle it as of importance for the time being, but of equal importance to you as undergraduates and as graduates. For a student to study chemistry or physiology, or any other elementary but fundamental subject, and then, having passed an examination, to throw aside that subject as he tackles another, is like a mason who is so foolish as to loosen several stones which go to form an arch as he adds other stones. In other words, these subjects of study are not obstructive but constructive, and lastingly constructive, so that when you have been practicing thirty or forty years you will be glad you kept them fresh in your mind, as you will find they help you every day. I venture to say that there is not a member of the Faculty who does not regret that he failed to regard with sufficient care many things that were taught to him as a student. When, therefore, you finally get your degree of M.D. it should not mean that you have successfully jumped so many obstructions at the end of each year, but to mix my metaphor, that you have built a house of learning of which the diploma is the mark of completion.

At the risk of being tiresome, let me say once more that the student who does not do his best to obtain and retain all that the course offers is laming himself in a race he has voluntarily entered. The man who does not keep as much as possible of the elementary branches fresh in his mind finds it difficult to grasp the advanced branches, not because they are in themselves difficult, but because he is difficult. No one of you would expect a child who had never learned ordinary arithmetic to keep up with other children who had learned it.

There is another aspect of this matter. If you regard the fundamental things you are taught as stupid, or useless, or grasp them only for a time for the low purpose of passing an examination, you will probably fail to amount to anything afterwards. You

will not be trained in constructive thought, you will not see in practice anything but a business of making money, and as you do not grasp the whole subject as a concrete thing you won't make a living.

There are some men who walk the path of life as does the lowly jackass, which passes everything by without notice and without any idea of what things represent. They are often worthy persons who rarely bray except at the sight of food, or a mate, and who only kick when the flies of life get intolerable, and when they do kick they at most cause amused surprise, and do not greatly disturb the flies. There are other men who tread the paths of life with a keen appreciation of everything about them, who remember what they have learned and utilize that learning in their daily life, who see in each thing they learn how it can be applied to an end, and who go through life triumphant, happy and complete. They are so active that they have given rise to the slang expression "there are no flies on him," and so you do not hear of their kicking; indeed, when a man is a constant kicker he is probably in the jackass class.

There is one thing lacking in a stupid man, namely, "imagination." If he had imagination he would not be stupid, and if it were possible for a stupid man to have imagination he would be unhappy.

The possessor of imagination may be blessed by it and cursed by it, for if used properly it is a value and if utilized improperly it is awful. In some individuals imagination gallops off with their judgment, so that they are in much the same position as Mazeppa strapped to the back of a wild horse. In still others, in whom the fire of imagination burns brightly and normally, being under as complete control as is the fire in an open grate, it warms the heart, gives zest to life, leads to success, and makes the daily task interesting and joyful. In the man with a dormant imagination, or in the man who possesses no imagination, the practice of medicine, or of any other pursuit, is a road which "leads upward all the way; yes, to the very end." He leads a

laden existence because "a primrose by the river's brim, a yellow primrose is to him, and nothing more." Such an unfortunate individual may be considered to lead his life in narrow alleys in which the sunlight rarely falls, while he who has a well-developed and well-controlled imagination walks in wide avenues filled with sunshine and fresh air. Imagination gives talent to the artist, the sculptor, the author, the investigator, the explorer, and not least to the medical man. It changes wearying toil into enjoyable exercise. Without it the world would cease to advance, for if there was no image in the minds of men of what may be found by research, toward what goal could they strive? It took imagination to conceive the telegraph, the telephone, the multiplied uses of electricity, for the development of the science of bacteriology, preventive medicine, and modern therapeutics, and, for that matter, all the advances known to the world.

Laennec, the great French clinician, seeing a child amuse itself by listening at one end of a log while another child struck the other end with a stone, had his imagination stirred and devised the stethoscope, and Bell seeing a child strike two stones together under the water while another child submerged its head, to hear the noise transmitted through the water, got his first glimpse of the telephone.

Imagination made Cope a great paleontologist and sent Leidy through his life surrounded by beautiful things, some of them ugly to the ignorant and unimaginative, but all of them lovely when viewed through his imaginative eyes. So lowly a thing as a rhizopod, or the flora and fauna of the intestinal canal of the rat, possessed interest and beauty for him when studied with the aid of his imagination, and they appear beautiful, even to us, when we examine the pictures of these organisms which he drew from life.

Sometimes persons who know nothing of medicine express surprise that we find it interesting or even tolerable as a pursuit. They do not know that if we have the real ardor and imagination, we see in every case

of disease alterations from the normal which are just as striking to us, and more important to humanity, than the wonders of Niagara, or the magnificent splendor of a raging sea, nor do they appreciate that in combating each individual disease we see the natural history of normal function distorted. We see the imaginative and sympathetic aspect of the case, the varying mental attitudes of the relatives of the sick man, some of whom allow their imagination to distress them and to destroy their judgment, while others seem stupefied and inert, regarding the sick man as an onlooker would regard a ship tossed on the rocks by the sea, feeling that they are powerless to be of service.

The laity often fail to understand that by the use of our imagination we devise means to prevent other wrecks, whereas the ordinary onlooker at a shipwreck sees only the existence of a horrible catastrophe and rarely thinks out a plan whereby another calamity can be put aside.

He who knows nothing of the subject cannot understand how a medical man can see in a morbid growth, a typhoid ulcer, or the swollen glands of bubonic plague, as interesting changes in the life history of cells as a botanist sees in the development of a flower and the artist sees in the changing colors of a sunset. While to the lay mind such a statement may seem excessive, to the trained mind, which can put aside that which at first appears disgusting, the fact is evident, and, furthermore, by the use of the imaginative faculty we not only study the pathological process which is present in a single individual, but determine how we may prevent its recurrence in generations yet unborn. As I have already said, what more dreary life, filled with misery, can be found than that of the medical man who has no imagination? He sees in a cancer only pain, toxemia, and an offensive slough. What more hopeful and buoyant life than that of the medical man who sees before him the actual processes involved, and who strives to aid in the better conception of the disease in order

that he may have not only a comfortable glow of knowledge but the joy of efficient service?

The man in the street sees that which interests him in a great crowd, pushing and jostling, and his interest is intensified if it begins to do damage, but he rarely goes so far as to allow his imagination to analyze the causes for the presence of the crowd, or to consider the ultimate results of its existence. The physician at the bedside in the presence of acute inflammation sees in his imagination, as he would see actually through a microscope, another crowd composed of red blood cells passing rapidly along the center of the stream with lazy white cells lagging along the walls of the vessels, just as the members of the crowd on its margin stop and look in the windows of the stores. An accident occurs and the crowd of cells hesitate; the lazy white cells stop and soon begin to wander out into the adjacent parts. So many of them gather, with the object of out-wandering, that the vessel is soon completely blocked at the point of excitement. Other abnormal changes occur and, possibly, local death takes place, and after this the physician once more clearly sees in his mind's eye the wonderful processes by which nature clears up the results of the disaster, completely restores the part, or walls it off, when restoration is impossible, with far greater efficiency than it could be done by human hands. With these facts before him the medical man sees in a case of inflammation a complete study in natural history, and by the use of his imagination, coupled with investigation, develops measures to control a similar process if it arises in another individual.

But the physician who uses only his imagination in studying the disease of his patient without also studying his mental processes, and those of his friends and relatives, has only in part fulfilled his office and done little for his success as a practitioner. The imagination should tell the physician that each mind differs from its fellow in health and still more so in the presence of disease, and that changes in mental

processes develop in the friends and relatives as well. Under these circumstances the physician's ability by the use of his imagination, to put himself in the place of the patient, or his friends, will enable him not only to treat the patient successfully, but to be a source of comfort and support. In the carelessness of youth and under the benumbing effects of long experience there is always the danger of regarding what to us is an every-day experience as being of little moment to the patient, and, not rarely, it is only when the physician becomes ill that the proposition seems peculiarly interesting and novel. Your imagination will let you see clearly that when a human being is traveling along a road that is beset with new conditions, and possible death, he is in quite a different position from the onlooker, who, standing "on the side lines," to use a football phrase, sees the sick man swept off his feet by a swirling flood of complications and then drag himself out on the hot path of his fever for another trudge.

Imagination will also often reveal the fact that the physician is not needed so much to minister to the patient who is ill as to those members of the family who, not stupefied by disease, are suffering from anxiety and distress.

There is still another bearing of this subject, namely, the use of the imagination in your intercourse with professional colleagues. If you use this faculty of the mind you will probably never be guilty of a breach of professional ethics or discourtesy, for you will be continually imagining how you would feel if you were in the other man's place. When as young practitioners you start out, filled with knowledge, your imagination will picture to you the way you will feel when, as a practitioner of thirty or forty years, you see a youngster settle in your town to be a competitor. Such a view will tell you how to act toward your senior, and your imagination had better go far enough to recognize that, while you may know many things taught by books, your older colleague knows many things taught by experience.

Imagination enables us to put ourselves

in the other man's place and to see things as he sees them instead of as we see them. It therefore makes us just instead of unjust, merciful, and tolerant, and he with such a lively imagination as to see things as others see them is sure of success, since he has a broad view and knows others as well as himself.

Let us, then, have a well controlled imagination that adds to the joy of living for ourselves and others, always imagine that things will be better rather than worse, and if imagination seems to threaten our judgment, at least to think, before we push it aside as useless, how much worse things might have been rather than how bad they are.

Over the main portal of the College Building you will find these words: "*Dii laboribus omnia vendunt*," which being translated means "The gods sell all things to those that labor." You note that the gods do not give all things, but sell all things, to those that labor. That is, they deal justly in that he who labors gets what he deserves. This motto is one for all men to bear in mind, particularly at the present time when the idea is general that the gods *give* to those who do *not* labor. This view recently, and perhaps to-day, is endangering not only the safety of the individual, but the safety of the world.

In your professional lives you may think that the gods are pretty slow in making their sales. If so, remember to ask yourselves whether you have worked hard enough to justify the gods in selling you anything, and ask yourselves furthermore, even if you have labored, if your labor has been intelligent enough and constant enough to produce a result which the gods should reward. Effort must be applied to the point where it will produce results. The

drowning man puts out so much effort that he hurries his sinking, whereas the cool-headed swimmer expending his strength wisely is saved.

With the preliminary training all of you have received there is not a man present who, if he devotes himself honestly to his studies, without grinding, cannot successfully obtain his degree. If any man loafs on the job he jeopardizes his chances, but if he takes his course as regularly as he takes his meals or takes his smoke his chance is good. Remember that you are entering a profession in which a mere knowledge of facts without reasoning ability is of little value. There is no profession in which reasoning is so essential, for man dealing with the widely varying reactions of human beings to disease in their physical and psychical states. You must from this day forward array facts, and some things that are not facts, in parallel columns, balance the columns well, and act accordingly. Years of experience are utilized in the army and navy to train men so they will reason well and quickly when the day of battle arrives. You are to train yourselves for a daily battle with disease all your lives, and upon your exercise of reason and judgment will the lives of others depend. Go to it, keep your eye on the ball, play the game, and you will find that the motto "*Dii laboribus omnia vendunt*" is wonderfully true.

And so, gentlemen, this address comes to an end. I trust what I have said may prove useful to you, and I beg you to remember that having enlisted under the banner of the Jefferson College and its Hospital it is not only your duty but to your interest to do so well here, and in future, that pride in her heart for you and in your hearts for her may never cease to live!



Notes on Treatment of Some Common Affections

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I. The Prophylactic Treatment of Syphilitic Infection.—Acquired syphilitic infection remains a local process during the first few days following the appearance of the primary lesion, the treponema remaining in the initial sclerosis and afferent lymphatics and satellite lymph nodes. The organism probably does not pass this barrier to invade the body until the lapse of about eight to ten days. The use of arsenical medication in the very early days of the primary sore may result in sterilizing the patient.

The indications for this arsenical medication are in patients who have had coitus with an infected partner, and a certain number of instances in which this has been done in adult males and females, and even nurslings who had had every possible chance of having been infected, have given encouraging results. Submitted to arsenical intravenous medication before the initial lesion had appeared these patients never presented any trace of disease. These facts confirm Dr. Magon's experiment. He inoculated himself with serous fluid derived from a chancre, and then was immediately given an intravenous injection of arsenobenzol. He never presented any primary or secondary accidents, and the Wassermann test was invariably found negative.

This prophylactic treatment of syphilitic infection, consisting of two or three injections in increasing doses according to the usual rules, should be exclusively reserved for subjects who have perfectly valid cause to suspect that they have been infected with syphilis. The physician should use judgment and not resort to this treatment in every person coming to him with the story that he or she has indulged in suspicious coitus, because the number of cases of syphilophobia is large.

II. Rheumatismal Conjunctivitis.—There is not a physician or surgeon who has not to deal with cases of conjunctivitis in his clientele. Therefore I merely wish to call

attention to a form of conjunctivitis whose causative factor is acute or chronic articular rheumatism, and which is likewise met with in middle-aged adults presenting an arthritic diathesis.

The cases of this ocular process that have come under my observation were somewhat as follows: The patient, a rheumatic and, therefore, arthritic, offers a simple conjunctivitis *with edema*. The lids are swollen, the conjunctiva, both palpebral and on the globe, is injected, and there is a trifling flow of clear transparent fluid containing few mucous shreds. Sometimes, however, the secretion may be frankly mucopurulent.

The subject will complain of a pricking sensation, especially marked in the afternoon and evening, and if questioned he will complain of joint or muscular pain. Such is briefly an outline of these cases.

In most instances it is enough to treat the rheumatism to produce an amelioration and later cure of the ocular manifestation, by the exhibition of sodium salicylate and the alkalies, but a local treatment will greatly hasten matters, and I can thoroughly recommend the following in these cases:

R Zinci sulph., 5 centigrammes;

Aquæ camphor,

Aquæ dest., aa 10 Cc.

F. S. A. Collyrium.

Sig.: One drop in each eye morning and night for six days.

As indicated the collyrium is used for six days. The patient should then cease its use and await events for six days. If after this time the conjunctivitis returns, the collyrium is again used for six days, and so on. In my experience this simple local treatment, combined with proper internal medication for the rheumatic diathesis, will result in a cure after one to two or perhaps three weeks.

Since we are on the subject of rheumatism I would suggest the following two

formulæ in cases of the acute articular form. The pain will be relieved by morning and evening frictions of the involved joints with the following:

℞ Methyl salicylate, 20 grammes;
Tinct. belladonnæ,
Tinct. hyoscyami,
Tinct. opii, aa 10 grammes;
Chloroformi, 4 grammes;
Liniment saponis, q. s. ad 250 Cc.

M. f. linimentum.

The following is a useful combination for internal use:

℞ Sodii salicylatis, 10 grammes;
Sodii bicarb., 3 grammes;
Aq. menth. pip., 50 Cc.;
Syrup. rub. idæi, q. s. ad 250 Cc.

M. S.: A soup-spoonful four to six times daily.

It is hardly necessary to add that the heart and pleura should be strictly watched, and the very first evidence of the onset of endopericarditis requires a revulsion of the cardiac area and the permanent application of an ice-bag.

It is important to keep the bowels open with mild laxatives, such as a powder composed of equal parts of sodium and magnesium sulphate, while diuresis should be obtained by drinking freely of some ordinary diuretic decoction, such, for example, as cherry stems, much used on the Continent, and unquestionably very efficacious when a mild diuretic is required. Or a decoction of the flowers of *scoparius* may be used in its stead. I must confess that these milder measures are too much neglected by the profession in the United States, who are prone to prescribe the more powerful diuretics, to my mind quite needlessly.

For hyperthermia tepid balneation is indicated.

III. The Prophylaxis of Sudden Death in Diphtheria.—Sudden death during convalescence from diphtheria is due to a general intoxication of the organism by the toxins secreted by the specific bacillus. I would also add that some of the late accidents of diphtheria may result from the setting at liberty of the soluble toxin fixed to the bacterial lipoids and to those of the

tissues in which the bacillus of diphtheria germinate. Antidiphtheric serum has neither a prophylactic nor curative action on the lesions produced by the constituent poisons of the bacillus, and it would likewise appear that the bactericidal sera in general are no more efficacious.

But antidiphtheric serum has an antitoxic action during the disease and may possibly ward off the late accidents by arresting the formation of the toxin and causing the rapid disappearance of the false membrane. Therefore, in order to get all that we can out of the serum treatment it should be begun at the very earliest possible time and repeated continually until all manifestation of the morbid process has disappeared.

I assume that at present it is admitted that the serum will not cure or control the late paralytic and cardiac complications of diphtheria, but some observers, among them Comly, Mongour, Soule, and Barbier, maintain that they have obtained some good results when the serum was injected as soon as an increase in the pulse-rate without a rise of temperature, weak cardiac contractions, and weakness of the cardiac sounds were detected. These observers repeat the injections in series—10 to 20 Cc. per day—for three to five days. I am unable to offer any personal opinion as to the success of this treatment, but I do know that in the past I have lost cases even when massive doses of serum were given.

After the false membrane has disappeared, during the phase of what I would term pseudoconvalescence, there are certain precautions that should invariably be taken, namely: (a) sustain the weakened organism; (b) watch the functions of the intestine, liver, and kidneys; (c) help the heart along; and (d) avoid any external cause which might determine syncope.

The general organic depression should be sustained by a light yet substantial diet, consisting of eggs, brain, and meats reduced to the state of pulp. In cases of paralysis of the velum palatinum, semisolid foods and thick broths are to be given, as

well as vegetable purées and creams, the patient being fed lying on the back. However, when there is albuminuria one must be content with an absolute milk diet.

Certain tonics may be utilized, such as cinchona or folia cocæ in the dose of two to four grammes daily, as well as a potion somewhat like the following:

℞ Ammonii acetatis, 2 to 4 grammes;
Syrup. ætheris (French Codex),
Cognac, āā 15 Cc.;
Syr. simplicis, q. s. ad. 90 Cc.

M. f. potion.

Sig.: Dessertspoonful 4 times a day.

The toxic products, retained or partially destroyed in the liver, are consumed in the blood and are eliminated by the renal glands. Therefore internal antisepsis has its indications, as well as renal stimulation, both of which are obtained by small, repeated doses of calomel.

To deal with the adynamia and collapse cardiac tonics must be exhibited as soon as the slightest change in the pulse is noted, which can be attributed to weakening of the heart. For this 2 to 3 Cc. of the following solution are to be injected in twenty-four hours:

℞ Strychninæ sulph., 1 centigramme;
Sparteïn. sulph., 10 centigrammes;
Aquæ destillatæ, 30 Cc.

M. f. solution for subcutaneous injection.

For the paralytic accidents the preparations of strychnine and nux vomica are useful, while in paralysis of the pneumogastric the use of the galvanic current—5 to 10 milliamperes—for ten to twenty minutes should be essayed. The electrodes are placed between the two tendons of the sternomastoid muscles, or the positive electrode may be placed on the front of the neck and the negative over the cardiac area. Faradization has been recommended in diaphragmatic paralysis.

Treatment must be persevered with even when cardiac collapse has developed or repeated syncope occurs, because some patients will recover, making a very slow convalescence.

On account of the depressive action of the toxin on the nerve centers the slightest

external influence or movement may cause sudden death, so that subjects in this state of adynamia or those presenting "exertion" dyspnea with a pulse going up to 90 or 100 from merely turning in bed, should be kept in the most absolute calm and quiet. Therefore, if the patient is a child, all treatment of the nasal or buccal cavities must be postponed if the child objects, and all attempts at gavage must be given up if this frightens the little patient.

All feeding must be done with the patient lying in bed, and consequently for this as well as other obvious reasons the selection of the nurse is not a negligible matter.

IV. The Exhibition and Doses of Arsenical Preparations, Other than in Syphilis.—Arsenic can be introduced into the organism by mouth, subcutaneously, or by the rectum, and I would say at once that mouth administration offers greater danger to intolerance than when given hypodermically. It is generally conceded that arrhenal (sodii metharsenas) can be indifferently introduced by mouth or subcutaneously, but with the cacodylic products the production of cacodyle oxide is always to be feared when given by mouth.

Some observers—Gautier among them—maintain that the subcutaneous administration should alone be adopted, but others are not of this opinion. If solutions are used the active medicament should be properly diluted in an appropriate vehicle in order to diminish the irritating action of the product on the gastric mucosa, especially in elderly subjects whose digestive tract is less tolerant to arsenic than that of children and adults. Arsenic preparations should always be given at the end of meals.

When giving Fowler's solution some tincture of opium may be added in a potion in order to assure tolerance, as follows:

℞ Liq. potassii arsenitis,
Tinct. opii, āā m. x.;
Syr. simplicis, 25 Cc.;
Aquæ dest., q. s. ad 80 Cc.

M. S.: For a potion to be taken in three parts, one after each meal.

The exhibition of arsenical products in

pills is very practical. Sodium cacodylate can be given in pills of twenty-five centigrammes each, one, two or three pills to be taken daily according to indications.

A coating of gluten with a resinous excipient is an excellent way of preserving deliquescent products, and when given in pill form with this coating one knows the exact amount of the medicament ingested at each dose.

In order to avoid the rather frequent untoward incidents arising from oral exhibition, some observers have advised the rectal introduction of the drug. Highly diluted Fowler's solution has been used, 5 Cc. being injected into the rectum once to three times a day, using the following solution:

℞ Liq. potassii arsenitis, 5 Cc.;
Aq.æ dest., 60 Cc.

In this way the patient will absorb from one-third to one centigramme of arsenous anhydride. Sodium cacodylate can be given per rectum in the dose of 5 to 7 centigrammes per day in place of Fowler's solution. But rectal injections are not without their disadvantages; the production of cacodyle oxide occurs, hence an odor of garlic in the breath. More important still is the development of diarrhea preceding proctitis, although the partisans of the rectal route state that these accidents are merely temporary and subside when the treatment is suspended for a few days.

However this may be, the hypodermic method is to my mind the only proper way to administer arsenical products when circumstances allow. In cases of gastric or duodenal ulcer, gastroenteritis, or cerebral anemia with vomiting, it cannot, of course, be given in any other way. Accidents due to intolerance are rare, or at least are very trifling should they arise, and Burlureaux was able in one case to inject 15 grammes—or nearly one-half ounce—of cacodylic acid in the space of seventy days. Personally, I have several times continued the hypodermic use of sodium cacodylate in the dose of thirty centigrammes daily for a considerable time. The minor inconveniences of the hypodermic use of arsenical

products are pain—rarely very sharp—at the time of the injection, but this does not necessarily occur, and occasionally small indurated spots may develop at the point of the injection, lasting for a few hours or perhaps a day or two.

To avoid these mild accidents the solution used must not be too concentrated. It is prudent not to exceed a solution stronger than 5 per cent, especially if 10 centigrammes of cacodylate are to be injected at a dose. In these circumstances it is better to inject 2 Cc. of a 5-per-cent solution than 1 Cc. of a 10-per-cent solution. Of late years I have resorted almost entirely to intramuscular injections of the drug in the gluteal or hypogastric regions, and this should invariably be done if mercury cacodylate or mercury salicylar-senate is given.

Whenever resorting to arsenical treatment in a given case, there is one rule that offers no exception, viz., that in the duration and general progress of the treatment, both for the mineral compounds and organic preparations, the doses are to be progressive with intervals of rest, in order to avoid immunity to the drug acquired by long-continued use. Begin by small doses, increase them progressively, then decrease, and then have an interval of rest before recommencing the cycle.

Now, especially if organic preparations are given, begin with a small dose and rapidly reach the maximum, maintaining this for several days, and then cease for a time equal to that of the duration of the administration of the drug.

Some give an injection every second day; others during five, seven, ten days, with an equal interval of rest, but the principle remains the same with mere variations in the detail of application.

As to the doses, since they vary with each preparation, I need only recall that the mineral compounds are much more toxic than the organic products; therefore they should be proportionate to the strength of the given product in metalloïd arsenic, usually represented by arsenous anhydride, which contains 75.757 per cent of arsenic.

For the organic preparations, the therapeutic doses vary in general between 2 and 10 centigrammes; 5 centigrammes may be said to be a good average.

Gautier observed that those tissues of the organism which are the richest in arsenic are at the same time those which contain the largest amount of iodine, and, on the other hand, that the elimination of arsenic by the menstrual blood is accompanied by a release of iodine whose proportion is notably greater than is normal blood—four and a half times, according to P. Bourcet. Therefore, Gautier suggested combining iodine with arsenical medication, especially in the form of potassium iodide. Some observers maintain that iodine aids in the elimination of arsenic, while others—among them Martinet—believe that KI simply acts as a reënforcing agent, and he consequently employs binary formulæ, namely, iodine arsenate and iodine cacodylate.

For these reasons adjuvant medication may be associated in the administration of arsenical products, such as the sirop-iodotannique of the French Codex—a highly efficient preparation when given in the proper cases.

Arsenic is present in minute quantities in a large number of waters, usually in the state of sodium or ferrum arsenate, and I here append a list of the better known Continental mineral waters with their arsenical content per 1000 Cc., according to the analyses of E. Willm:

<i>La Bourboule</i> (Source Perrière)	Na arseniate 0.0155 gramme
<i>Royat</i> (Grande Source)	Na arseniate 0.0008 "
<i>Saint Nectaire</i> (Source Mont Comadore)	Na arseniate 0.0015 "
<i>Chapel-Guyon</i> (Source Deval)	Na arseniate 0.0018 "
<i>Vichy</i> (Grande-Grille)	Na arseniate 0.0008 "
<i>Vichy</i> (Néo-Célestino)	Na arseniate 0.0008 "
<i>Plombières</i> Na arseniate between 0.0004 and 0.0008	"
<i>Mont-Dore</i>	Na arseniate 0.001 "
<i>Vals</i> (Source Dominique)	Ferri arseniate 0.001 "

The water of the *Hamman-Meskoutin Spring* in Algeria contains one-half milligramme of arsenic per liter, while in Italy the *Levico* waters contain calcii arseniate 0.00905 gramme per liter.

V. Treatment of Nocturnal Enuresis.—Among the innumerable antispasmodics advocated in the past for the treatment of

nocturnal incontinence of urine, chloral, antipyrin, belladonna and its alkaloid atropine are the only ones that have stood the test of time. Belladonna should be administered according to the indications given by Trousseau in progressively increasing doses: one centigramme of the extract every evening at bedtime, increasing the dose one centigramme every four or five days until fifteen to twenty centigrammes are reached. The maximum dose is then continued for several weeks and then progressively decreased.

However, atropine should be preferred to belladonna for several reasons. Atropine should be given in three doses—morning, noon, and night—in a spoonful of sugar-water, the following formula being ordered:

℞ Atropin. sulph., 1 centigramme; .
Aquæ destillat., 10 Cc.

For young children it is well to commence with two drops of this solution three times daily and to increase the dose progressively until a maximum of fifteen to twenty drops is reached.

In children of six years of age, five drops three times daily will be the initial dose, and this is progressively increased to thirty drops a day. In children from thirteen to fourteen years of age, fifty or even sixty drops may be the maximum dose, beginning with ten drops thrice daily.

The maximum dose is continued for two or three days, and then the dose is progressively decreased. The medication is to be interrupted as soon as symptoms of intoxication are noted, such as dryness of the mouth, disturbance of the vision, etc. In about a fortnight it can be begun again, but with moderation.

Rhus aromaticus will sometimes act quite surprisingly in the control of enuresis, and some regard it as almost a specific. The drug is given in the form of a fluid extract in the dose of five, ten, up to thirty and sixty drops a day.

Antipyrin unquestionably will give results in some cases of nocturnal incontinence of urine. The drug should never be prescribed alone in the form of powder or cachet, because it has an irritating action on the

gastric mucosa which will give rise to pain with a burning sensation and pyrosis, sometimes even nausea and vomiting.

Antipyrin may be given in tablet form or cachets if an equal quantity of sodium bicarbonate be added, and followed by a cup of hot drink. Or a wineglassful of Vichy water may be taken, while the freeing of carbonic acid which results facilitates the tolerance by the gastric mucosa of the drug.

Antipyrin can also be given per rectum should occasion require it.

The time at which the drug is given is not indifferent, two hours being allowed between each dose. Besides, the nearer these doses are given to bedtime the more effective will be the drug in the control of the enuresis. For example, a child takes two grammes of antipyrin in twenty-four hours,¹ one at 6 P.M., the second at 8 P.M. He will not void urine probably until about 5 A.M. Now, if the drug is given at 9 P.M. and again at 11 P.M., the enuresis occurring in the second half of the night may be controlled.

A cure may sometimes be obtained from the very onset of this treatment, but the drug should be continued for at least a fortnight in order to have the good effect continued, all the more so for the reason that in some children the incontinence disappears while treatment is going on, but will return as soon as the drug is no longer given.

As a conclusion I think it safe to say that the results obtained by antipyrin are perhaps on the whole better than with any other drug, and it should be essayed because of its easy administration and absence of untoward effects. Children present a peculiar tolerance for the drug when combined with sodium bicarbonate.

Under the heading of surgical treatment I refer to retrorectal injections of saline solution as practiced by the late Professor Jaboulay of Lyons and Cathelin's procedure of injections of a saline solution or a 1-per-cent solution of cocaine in the epidural space. I can commend the latter pro-

cedure highly as giving excellent results, especially in obstinate cases, but to give the details of the technique would require too much space, so that I refer the reader to Cathelin's work entitled "*Conferences Cliniques et Therapeutiques de Pratique Urinaire*," 2d edition, Paris, 1912, for a description of the author's method in his own words.

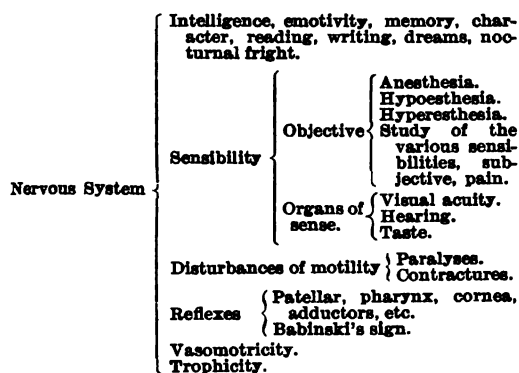
I cannot insist too strongly on the important fact that the procedure must be carried out to the letter, otherwise failure in results is certain.

I would add that the removal of any factor producing disturbances of the peripheral nervous system must not be overlooked, especially the external genito-urinary organs of both sexes. Irrigations of potassium permanganate and instillations of argentic nitrate will quickly cure a vulvitis, non-specific urethritis, or balanoposthitis. Adhesions of the prepuce should be broken up, circumcision should be done if phimosis exists, and urethral polypi removed when present. The urethra should invariably be inspected, because from my own experience I have found polypi relatively common in male subjects of eight or more years of age.

Although this paper is strictly confined to treatment, I cannot refrain from appending the two following tables that I use in my lectures on the urological affections in children, because they outline the examination of the child who suffers from symptoms of the urinary organs, and nocturnal enuresis is certainly one of the most frequent with which the practitioner has to deal:

Genito-urinary System	External organs: shape, congenital defects, discharge, adhesions.				
	Urethra: polyp, catheterism, and resistance of the sphincter.				
	Bladder	{	Catheterism, contents, calculus, neoplasms.		
			Vesical tolerance.		
			Frequency of micturition, incontinence, hematuria, pyuria.		
	Kidneys: Pain, palpation, ballotement.				
	Urine	{	Normal elements	{	Acidity.
					Chlorides.
		{	Abnormal elements	{	Albumin.
					Sugar.
Indican, etc.					
Epithelial elements.					
Bacteriological examination, cultures, inoculations.					

¹We regard this as an unsafe dose.—Ed.



To return to treatment, it goes without saying that both medical and surgical treatment may be combined with great benefit to the patient, but I prefer to resort to medication just because it will be more readily accepted by the parents, and later on, if medical treatment be of no avail, Cathelin's procedure can then be advised.

Let us now consider the treatment of the factors of enuresis which reside in the genito-urinary system. The affection may be due solely to an abnormal composition of the urine, an irritation of the vesical mucosa or sphincter of the posterior urethra. As to urinary incontinence having a chronic interstitial nephritis as the cause I must confess that no instance has ever come to me, therefore I can express no opinion.

With this exception, in all the other varieties of enuresis, the method of treatment will, in its general outline, be local, general, and of the nervous system.

The urine may be alkaline on account of fixation of the alkaline carbonates, without symptoms of cystitis. Therefore, in these circumstances the acid phosphate of sodium is indicated and given in quantities necessary to make the urine strictly neutral, because if too much of the drug is given the urine becomes acid and the enuresis will continue. On the other hand, the urine may be acid, so that sodium bicarbonates or alkaline mineral waters, such as Vichy, Vals, or Evian, should be given. Vesical irrigation with a tepid solution of a very mild boracic acid solution may also be essayed. The treatment should be con-

tinued for quite a time, otherwise recurrences are prone to occur.

Now if the urine contains urates, two grammes of lithium are to be taken daily for ten days each month, while during the remaining twenty days the waters of either Royat, Evian or Pouges should be taken, and I would likewise commend Contrexéville water in these cases especially.

At the same time a vegetable diet should be ordered, only a small quantity of white, lean meat being allowed, while if albumin is present a mixed vegetable and milk diet should be ordered, and dechloridation as well should circumstances require. As drinks, Vichy, Vals, Vittel, or Contrexéville waters are indicated.

Urotropin will give good results because the excess of phosphates irritates the vesical mucosa, and this irritation reacts on the spinal cord, inducing enuresis, so that the nervous system requires attention.

All the antispasmodics referred to can be resorted to with advantage—atropine, antipyrin, or chloral. The only contraindication for the first two drugs in incontinence is when albumin is present. If an olive-tip sound shows that the posterior urethra is sensitive and that the sphincter strongly contracts, and if the bladder allows a normal quantity of fluid, or a little more than the normal, to be injected into its cavity, these data indicate that there is excitation of the urethral sensitive system with integrity of the sphincter. Therefore sedatives are indicated for the nervous system, so that belladonna or atropine is essentially indicated and should give brilliant results, while antipyrin and chloral can also be administered during the interval of repose in the atropine medication.

If now the urethral mucosa is not abnormally sensitive and there is atony of the sphincter, the antispasmodics are to be formally rejected, and on the contrary stimulants such as strychnine and ergot are to be exhibited. Rectal massage and electrization of the sphincter will give excellent results. At the same time a general tonic treatment should be prescribed.

The bladder may be atonic or the sensibility of its mucosa may be found obtuse, although the tonicity of the sphincter is normal. In these circumstances the patient micturates from overflow, and if this occurs in the night the case is regarded as one of enuresis, which it is not. Therefore never give the antispasmodics, but, on the contrary, prescribe *nux vomica* or strychnine. Ergot will often be beneficial.

These cases are especially met with during the convalescence from serious affections such as typhoid fever, scarlatina, etc. A general tonic treatment and proper feeding are the best curative agents in the long run.

If a cystitis is the result of a gonococcal or colon bacillus infection daily, or every second day, irrigations with a 1:10,000 argentic nitrate solution or a 1:3000 protargol solution should be given, and if nitrate of silver is used—and in my experience none of the new silver preparations are half as effective—the solution can be progressively increased to the strength of 1:3000 to 1:1000 if required.

Tuberculous infection of the kidney is a not infrequent cause of enuresis at its onset, and here the correct diagnosis must be made and the offending kidney removed, which will cure the nocturnal incontinence.

I would in closing say that failure in treatment of nocturnal enuresis in children may be expected in all cases of degeneracy, and that enuresis symptomatic of a debilitated state of the general health will be rapidly ameliorated or cured by proper feeding and the exhibition of cod-liver oil and sodium cacodylate.

3 RUE BELLOT.

Chemical Changes in the Blood in Disease.

MYERS, in the *Journal of Laboratory and Clinical Medicine* for October, 1920, states that although the practical value to be derived from the estimation of the blood chlorides can hardly be compared with that of some of the other blood constituents already described, still it is believed that the

preliminary estimation of the chloride content of the blood in cases of nephritis may often be of great assistance, particularly in indicating the extent to which chlorides should be restricted in the diet. Furthermore, this estimation should be utilized to determine when the blood chlorides have returned to their normal level. It is believed that in the past chloride restrictions have often been made when they were not indicated, and, when indicated, have been continued until in some cases the chlorides of the blood reached a subnormal concentration.

In general it may be stated that high blood chlorides have been found in nephritis, certain cardiac conditions, in anemia and some cases of malignancy (possibly due to an accompanying renal involvement), while low values have been observed notably in fevers, diabetes, and pneumonia. The chloride retention in most cases of nephritis apparently results from impaired renal function.

The excretion of chlorides and nitrogen seem to be fairly independent functions. In contrast to so-called parenchymatous nephritis, the function of excreting chlorides in interstitial nephritis appears to be much less impaired than that of excreting nitrogen. Consequently a restriction in the chloride intake in the latter condition may fairly quickly restore the chlorides to normal.

When cases of advanced nephritis with marked nitrogen retention are put on a restricted chloride diet it is sometimes noted that the blood chlorides drop to a subnormal level, such as is occasionally found in severe diabetes. A possible explanation for this is that, owing to the large amounts of urea and sugar present in the blood in these conditions, less chloride is needed to maintain normal osmotic conditions. This may also help to explain the increased blood chlorides in anemia.

It is of considerable interest that the chloride retention in pneumonia is associated with a decrease in the chloride concentration of the blood.

Editorial

DIAGNOSIS AND TREATMENT OF MYOCARDIAL IN- SUFFICIENCY.

In an excellent address which was delivered before the Canadian Medical Association during the past year by Greene, he emphasized one point which must have already become clear to many general practitioners, namely, that while there has been a great accumulation of scientific truth in regard to heart disease within the last few years, the patient has benefited but little, chiefly because some of the instruments of precision, by which a very accurate diagnosis can be reached, are quite out of the reach of the general practitioner not only because of their great cost, but also because it is impossible for the busy practitioner to become skilful in their manipulation.

Nevertheless it is the duty of every medical man to study this new knowledge in order that step by step he may be better qualified to treat patients belonging to a very large group of those who are ill, or of those who will certainly become ill if measures for their protection are not instituted.

The mass of material which was accumulated by medical men in the service of Great Britain and the United States during the war is so great that it is difficult to deal with it, and in all probability its very bulk will prevent us from obtaining from it the value which might be received had the facts been accumulated more slowly and so been more readily given their proper value.

Again, as Greene pointed out, most of this material, or increased knowledge, is, after all, of little value to the middle-aged or elderly cardiopath since it deals with those who were of such an age that they could be taken into service, and does not deal with young persons who manifestly were cardiopaths and who, therefore, were not enlisted.

We have for many years in the columns of the THERAPEUTIC GAZETTE urged the point that almost the whole problem in cardiac disease rests with the condition of the heart muscle rather than with the state of a valve or valves which may be diseased. Twenty years ago the valvular lesion received much attention. To-day, except as an important collateral factor in the study of a case, it is properly ignored, and possibly no one has been more energetic in insisting upon a study of the myocardial state to the exclusion of the valvular lesion than Sir James MacKenzie. While many of us have recognized and taught this view, he, because of his remarkable researches with instruments of precision, has been in a position to enforce and emphasize his opinion.

Therefore it becomes manifest that many cases can be saved as to discomfort, and their lives prolonged, if the physician recognizes that an undue strain is being thrown upon the heart, and, more important still, appreciates the fact that the heart muscle has lost much of its pristine vigor either because it is fatigued or, more important still, because it has undergone more or less degenerative change with the result that its margin of safety is materially diminished.

There are a number of facts in regard to what might be given the popular term of "weak heart" which should be considered. During the war it was soon recognized that there was a class of patients who in ordinary life were not regarded as cardiopaths, but who were manifestly weak as to their cardiovascular apparatus from the moment of birth. Many of these cases were called "D. A. H." cases, and various other terms, such as neurocirculatory asthenia, were employed to cover them. These patients in many instances have a faulty physical development which is universal; long, thin chests which are shallow, and feeble hearts which have never

permitted the patient to enter into the vigorous sports and games of his comrades in childhood without distress. Something can be done if these cases are recognized at, or shortly after, puberty by graduated exercises and careful attention as to mode of life to increase the tone and development of the cardiovascular apparatus, but little can be done for them after they have reached mature years. Furthermore, this type of case, because of lack of resistance on the part of the cardiovascular apparatus, falls a victim to valvular or myocardial lesions during the course of acute infections more readily than does the normal individual, and so acquired lesions are superimposed upon congenital faults. In our belief courses of small doses of digitalis with arsenic should be given from time to time to these patients, not so much with the idea that the digitalis will act as a definite cardiac stimulant as that by recurring courses of this drug, with arsenic, a definite improvement in the development of the cardiovascular apparatus in the second and third decade of life may result.

There is too great a tendency on the part of the profession, however, to administer drugs in these cases rather than to recognize that the duty of the physician is to frankly discuss the condition with the patient and describe the method of living which should be followed, the chief point being on the one hand not to depress the patient with the thought that he had heart disease, but to inform him as to his limitations and to point out that just as a badly sprained ankle may cause him to be cautious for the rest of his life when attempting to run over rough ground, so the condition of his heart requires that it shall not be put to excessive stress and strain. Furthermore, such patients are prone to jump to the conclusion that they must live by brain work rather than by hand work and thereupon take up some profession or business which they think will require little physical effort. Manifestly this is a better course of life for them than hard labor, but on the other hand such patients often throw themselves into intellectual pursuits

with extraordinary vigor and enthusiasm and entirely fail to recognize the fact that long-continued mental and nervous strain makes demands upon the heart and nervous system which a naturally feeble heart will not permit. Few persons appreciate the amount of energy which a heart is made to expend under prolonged keen mental activity, and in some instances it were better that the patient should lead a life upon a farm, without doing the hardest kind of work, rather than that he should enter an office where, while his general muscular system is at rest, his cardiovascular and nervous system is continually under stress.

Another point to which too little attention is given, but which is emphasized by Greene, is the recognition of the fact that after an acute illness it not infrequently happens that the heart is the weakest organ in the body, and yet the patient, within a short time after his temperature becomes normal, is allowed to get up and go about and often to pursue his ordinary avocation, with the result that his convalescence is greatly prolonged, or that sooner or later he suffers from a cardiac breakdown which may be brief or which may persist for the rest of his life. The great epidemic of influenza, fearful as it was, served to illustrate this point not only in regard to influenzal infections, but as to all other infections, in a way in which it had never been emphasized before, and it is true that since the great epidemic of 1889-90 physicians had been more and more impressed with the fact that the greatest care must be taken of the heart during convalescence from this type of infection.

In many instances the symptoms described by the patient are not definitely cardiac. He does not connect them with the condition of his heart, but with his digestive apparatus or with other functions, when in reality the disordered action of the liver, the stomach, or other organs is in reality dependent upon impaired circulation. Often these symptoms will clear up if the heart is given rest, and will not clear up by mere regulation of the diet and

the administration of digestive tonics. Too much emphasis cannot be laid upon this point, and it is unfortunate that even by the use of the electrocardiograph we may not be able to determine with scientific accuracy how weak the heart muscle is since this instrument of precision is of more importance in studying the condition of the different portions of the heart and of its conductivity than it is in determining that its functional ability as to vigor has become impaired.

THE IMPORTANCE OF THE SCHICK TEST IN THE PREVENTION OF DIPHTHERIA.

The introduction by Schick in 1913 of a method by which children susceptible to diphtheria may be recognized and protected from infection by isolation or immunization may be considered to have been as great an advance, if not a greater one, than the earlier introduction of diphtheria antitoxin for the cure of the disease when it is actually in existence.

The Schick test has now been employed in so many hundreds of thousands of cases that its position is as definitely established as is the position of vaccines, and although the principle involved is different, the results in diminishing morbidity and mortality may be considered similar.

Some skill, of course, is needed to see that the test fluid is injected intradermally and not subcutaneously, and this requires a good syringe and a fine needle, the needle being usually 26 gauge, care being taken that both it and the syringe are always sterilized by boiling or with alcohol. If alcohol is used, the syringe and needle must be freed of it by rinsing them with some diluted toxin, which is then discarded. Usually 0.2 to 0.3 Cc. of the properly diluted toxin is injected into the flexor surface of the right forearm two or three inches below the elbow, and a similar amount of heated diluted toxin used as a control is injected into the left forearm.

It is of great importance that the physician should be able to identify a true positive reaction. If the individual is susceptible to diphtheria within twenty-four to thirty-six hours there develops in the area where the unheated toxin is applied a zone of redness about half an inch or a little more in diameter. This gradually becomes markedly developed within the next forty-eight or seventy-two hours, and by the fourth or fifth day reaches its limit, persisting for seven or ten days, and on fading leaves a brownish area which desquamates and then fades, but often some pigmentation will remain at the spot several months. On the other hand, if the individual is not susceptible and the test is negative little change takes place in the appearance of the skin, or if it does, what is known as a pseudonegative reaction develops. Its redness appears somewhat earlier than the true test, reaches its full development at the end of twenty-four hours, and at the end of four days has almost entirely disappeared, although there may be very slight desquamation in the center.

It is also true that in some pseudoreactions there may be well-marked reddish pigmentation at the end of four days. It is supposed that this pseudoreaction is due to anaphylaxis, depending upon the protein in the injection, and if there is any doubt as to whether the reaction is true or false the differentiation may be made by using a control test on the opposite arm with a toxin which has been heated for ten minutes to 75° C. This heating destroys the toxin but does not affect the protein of the poison. In other words, the person who has given what is thought to be a pseudoreaction will show similar effects in the test and in the control lesion, whereas an individual in whom the test is positive will show the well-defined redness where the toxin has been used on the right forearm, and no reaction on the left forearm where the control test has been placed.

It is evident that the toxin used must be of standard strength, and it is also evident

that where the test is negative the child is protected by having within its own blood a sufficient amount of antitoxin, whereas in the presence of an epidemic if the test is positive an immunizing test should be given, or where there is no immediate danger of infection diphtheria prophylactic, that is toxin-antitoxin, should be administered. The advantage of toxin-antitoxin is the long period of immunity which it induces, which is supposed to last from six months to two years, whereas the immunity induced by antitoxin is much shorter than this. The disadvantage is that in the presence of an epidemic it does not act quickly enough, and under these circumstances the antitoxin should be employed.

A valuable paper upon this subject has been contributed to the *Journal of Laboratory and Clinical Medicine* by Zingher, who well says that the Schick test should be used in the home where the child has developed diphtheria to determine whether other members of the family, children or adults, are susceptible, and those that are susceptible should receive an immunizing dose of antitoxin. The same thing holds true in institutions and schools.

Another point of importance pointed out by Zingher is that in many thousands of tests it has been shown that children over two years of age who give negative reactions will continue to give such reactions over a period of years. In other words, a negative Schick test in a person who is naturally immune indicates a long and persistent immunity.

A word may be said in conclusion in regard to the method by which the toxin for the use of the Schick test is to be used. The toxin is sold put up in capillary tubes, accompanied by another tube or small vial containing salt solution in sufficient quantity of both to make ten tests, or in other instances in such bulk of each to make fifty tests. The contents of the tube containing the toxin is mixed with the contents of the vial of normal salt solution, and then 3 minims of the mixture is injected intradermally with the results already described.

THE PROPHYLAXIS OF SYPHILIS.

Whatever may be said in regard to the moral aspects of this question, it is universally recognized, by those who are well informed, that active measures for the prevention of syphilitic infection should be generally known and widely employed. There can be no doubt that the incidence of the disease has been markedly decreased by the dissemination of knowledge as to how it is acquired and by the early use of calomel ointment. Nevertheless, for various reasons, infections constantly take place, and therefore we are interested in a report which has been made by Michel and Goodman as to the prophylaxis of syphilis by the use of arsphenamine. It is evident that this method cannot have a very wide employment except in connection with institutions and in the hands of Health Boards. Goodman had an opportunity to treat a large number of males in the tropics who had been exposed to women who were in a large proportion syphilitic. These men were given a full dose of arsphenamine within forty-eight hours after exposure. Most of them were under observation for a comparatively short time, and therefore it is not possible to determine whether late manifestations occurred, but in a considerable number no primary lesion had developed after the ordinary period of incubation, or even as long as six months later.

More recently they have carried out this method in about thirty additional patients who had been exposed; that is, to persons in whom it was definitely possible to make a diagnosis of syphilis in an active stage in the opposing partner.

In these cases only 0.3 of arsphenamine was used, three doses being given at intervals varying from every other day to five days. In the patients treated in this manner a sufficient period has passed, over and above the ordinary time of incubation, to render it probable that infection has not occurred, and, furthermore, no patient so treated has developed a positive Wasserman

mann although repeated tests have been made.

These authors also quote two French clinicians who observed forty women who had been exposed to infection by reason of syphilitic partners, all of the latter being proved to be specific cases by the discovery of the spirochete, the Wassermann test being positive in all except five. The women were free of all suspicious lesions and the Wassermann was negative in all. None of them had used preventive measures, and not one of the forty ever showed any lesion or developed the Wassermann reaction, although twenty of them have been under observation over three years. Five women who refused all treatment, who were similarly exposed, were attacked later.

It would appear, therefore, that it is not only wise to use prophylaxis in the way of external applications, but where real exposure is suspected to resort to small intravenous doses of arsphenamine to make assurance doubly sure. Obviously larger doses should be employed if treatment is instituted late than if it is instituted early.

THE IMPORTANCE OF LEAD AS A POISON IN OBSCURE CASES.

Many years ago the late Horatio C. Wood taught that whenever a patient presented obscure nervous symptoms, so that a definite diagnosis was difficult, the physician should suspect the presence of syphilis or lead poisoning, and a host of eminent neurologists have from time to time emphasized the difficulty of making a differential diagnosis between the early manifestations of a true locomotor ataxia and the pseudotabes due to lead.

In England, Oliver has made a number of notable contributions to this subject, rather from the toxicological than from the neurological standpoint, and we have from time to time called attention to the fact that very brief exposures to lead as a toxic agent may induce subacute or chronic poisoning. Thus it will be recalled that

one British investigator reported instances of chronic lead poisoning from the application of Goulard's extract, and others have reported it as a result of the application of diachylon plaster.

In some obscure cases the diagnosis is made possible by the administration of fairly full doses of iodide of potash or soda, so that a double soluble iodide of lead is formed, which being readily eliminated in the urine provides in this fluid a manifestation of the poisoning. This is important to remember because in some instances no lead will appear in the urine until the iodides are administered. Chapman has claimed that one-quarter to one-half milligram of lead per liter of urine indicates that enough lead is present to cause chronic lead poisoning:

Very recently McDonald and McCusker have reported a series of twelve cases, all of which presented nervous disorders of many types, but none of which showed the classical symptoms of lead poisoning, such as the blue line in the gums, anemia, or stippling of the blood cells, the diagnosis in all twelve cases being reached only by the urinary examinations. In one case the patient had worked in a paint shop as a paint scraper and suffered from right hemiplegia with aphasia, but presented no evidences of neurosyphilis. In another a right hemiplegia without aphasia developed, after a tooth extraction, in a carriage painter by trade. Here again lead was obtained in the urine. In another instance a man in excellent health in other respects suffered from severe migraine, and it was found that the house tap-water was contaminated with lead.

We are doubtful whether the cases of hemiplegia were due to the lead directly or indirectly, but the reports are interesting as emphasizing the importance of lead as an agent which is capable of producing obscure symptoms.

They also emphasize the importance of urinary examinations by chemical methods in obscure cases, and in some instances, if not in all, where syphilis is supposed to be the cause even if the patient presents a

positive Wassermann reaction, it will be well to remember, nevertheless, that a patient who has acquired this infectious disease may be a sufferer from lead poisoning and that his symptoms may be due to the latter cause rather than to syphilis.

ILLUMINATING GAS AS A FACTOR IN ILL HEALTH.

At a recent meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia, Wilmer of Washington read a paper upon this subject, with special reference, of course, because of his distinguished position as an ophthalmologist, to the effect of slow or chronic gas poisoning upon vision. A very considerable portion of his paper, however, was devoted to the psychical and physical manifestations of such poisoning. Thus he reported instances where persons occupying certain premises, seemingly in perfect health, before long developed visual disturbances which were in the nature of hallucinations, a general loss of mental and physical vigor, and at times hallucinations as to sounds, all of which symptoms passed away on removal from the house in which these symptoms developed, although a considerable period of time elapsed before complete recovery occurred.

We call attention to this matter not only because it serves to impress upon us that in the treatment of certain symptoms we must look for illuminating gas as a cause, but also because it serves to impress upon the mind the fact that the physician should not alone treat the symptoms which arise in a given case, but should go further than this and discover the cause.

In the cases reported by Wilmer, it was not always illuminating gas, but gas which escaped from furnace flues or range flues in such a small quantity as not to be noticed by the inhabitants of the house, but in sufficient amount, over a lapse of considerable time of exposure, to produce very definite effects. In all instances where gas is responsible for the development of an

evil turn of symptoms, carbon monoxide is the dominant factor, although in all probability other gases which are associated with it are to some extent responsible. In the case of ordinary illuminating gas made from coal, Remsen found the percentage of carbon monoxide 7.9, whereas in so-called water gas the percentage of carbon monoxide was 28.25.

Of course in the great majority of instances the characteristic odor of the illuminating gas reveals its presence and so the individual is warned. This is to some extent true of the gas which escapes from bad flues or stovepipes, and yet it is a well-recognized fact that if the quantity of gas is small the patient so readily becomes accustomed to its presence, so far as its odor is concerned, that he is unconscious of its existence and so continues to inhale it over a long period of time.

The changes in the body which are produced by exposure day after day for weeks at a time are little known: first, because such cases rarely come to autopsy, or, if they do, the underlying cause of the death is not recognized; but it seems to us, in view of Wilmer's contribution, that where an entire family suffers from ill health this question of gas as a causative factor should be carefully investigated. Possibly in some instances a change for the better in the health of a patient, or patients, which follows resort to another climate on the advice of the physician are not due so much to the climatic change as to escape from this cause of disease.

Closely allied to this matter of obscure causation of symptoms we must remember that sometimes drugs which are used as remedies produce symptoms for which treatment is administered, as in the case of incontinence of urine in children developing on the administration of iron or quinine, or the polyuria of infancy which is induced by the too free administration of sugar of milk. In the first case the child may be punished physically by the parent and medicinally by the doctor. In the second case the continued crying of a child because of thirst induced by polyuria results in

excessive feeding or in some modification of the food formula which is entirely unnecessary.

The real point is in studying disease or abnormal symptoms, to look for unusual causes as well as common ones.

ACUTE INFECTIONS OF THE HAND AND THEIR SURGICAL TREATMENT.

Since Kanavel's masterly brochure on this subject there has been a marked improvement in the results of treatment for acute infection of the hand. With a larger understanding of the anatomy, of the somewhat different directions in which from a given focus infection spreads, a better concept of adequate drainage, the cases in which either function was destroyed, the extremity lost, or even life itself sacrificed are now brought to a successful conclusion.

In spite of preventive measures—i.e., sterilization of wounds, early care of skin infections, particularly those developing beneath the callouses—hand infections still remain common and a certain proportion of them end disastrously, often, but not always, incident to inadequate surgery. From which circumstance Coughlin's contribution on the subject (*New York Medical Journal*, Oct. 30, 1920) is of importance. He calls attention, first, to infection of the matrix of the nail, its persistence and the ease with which it may be promptly cured by removing that portion of the nail overlying the infected area, and applying a moist, mild saline dressing, supplemented by rest of the part. For infections of the fold of the nail he advises cutting through the fold backward from its free edge on each side until the incision reaches as far as the root of the nail extends, turning back the flap and examining the matrix to be sure it is not infected, removing the nail if there be pus under it, covering the raw surface with a thin bit of rubber, and putting on a wet dressing which is kept wet, the part being then immobilized.

Infection of the pulp of the distal

phalanx calls for free incision. This relieves tension, and it is tension which causes death of the periosteum, the skin, the bone, and all the intervening tissues. It is noted, at the outset of periosteal suppuration, while the patient is complaining bitterly of the pain, there is very little swelling of the part or perhaps none whatever.

Careful examination will always reveal a point of maximum tenderness, which is to be found by pressing gently on the skin with a toothpick or some such pointed object. The patient can locate this spot very accurately. This tender point exists early in the disease before the infection has spread far or broken through the periosteum. Under the tenderest point between the periosteum and the bone is the seat of the trouble. Over this point is the place to open, and the knife point should reach the bone here only. A large incision is never needed if one can get the patient early. Often only a very small drop of pus is found. The process usually lasts two or three days before the periosteum gives way.

Knowing the pathology, course, and prognosis of infections, no sane man would counsel any other than surgical treatment; yet those who do not know advocate poulticing until the felon—for this a real felon—is "ripe."

The offending organisms in hand infections are usually the staphylococcus and the streptococcus, and the pus is thick and does not run out easily. Saline in which citrate of soda has been dissolved, two drachms to a pint, helps to thin the pus. So does Dakin's solution. Dress with gauze moistened in such a solution, change often, and keep the part at rest. Instead of the moist dressing, constant immersion in a hot bath of saline and citrate is often better.

Infection (metastatic) of the web of the first space is in a class by itself, inasmuch as it is nearly always intermuscular from the beginning. It follows infection of either thumb or index-finger and can occur by direct extension of pus along perifascial lymph spaces, or by the ordinary lymphatic route to the base of the thumb or index,

and then along muscle tendons into the intermuscular space between the first dorsal interosseus muscle and the adductors of the thumb. Tenderness on deep pressure is the sign to watch for, and the space should be opened as soon as that sign appears.

An abscess in this web can readily become a palmar abscess by dissecting its way around the edge of the adductors of the thumb, or along the palmar arch, or it can spread to the wrist along the synovial sheath of the flexor longus pollicis. In dealing with abscess in this web, no muscle is cut. Through-and-through drainage is never used.

The deep palmar fascia is strongest over the middle compartment, and over all compartments thins out, becomes cribriform, and finally fails entirely as we proceed distally. It disappears first in the interdigital spaces, leaving the digital vessels and nerves uncovered by it as they enter the webs of the fingers.

Here the superficial fat of palm and web becomes continuous with fat and areolar tissue under the deep palmar fascia. One can thus see how readily a primary superficial abscess can become a deep palmar abscess by direct extension, because the fascia forming the roofs of the palmar compartments is so strong and unyielding, and abscess in any of the compartments may spread well up into the wrist or forearm along the tendons or into its neighboring compartment long before it points on the surface of the palm. The swelling in the palm is for the same reason never marked until the abscess is well advanced.

Swelling on the back of the hand is always marked, but this swelling alone should not induce one to incise the dorsum. It is nearly always lymphedema, because the lymphatics drain toward the dorsum, but pus does sometimes collect here in the perifascial lymph space, and here as elsewhere localized deep tenderness is an early and never failing sign. The tender spot should be opened as soon as found. To "squeeze out" the pus is the most primitive surgery.

How to open a palmar abscess is a real problem, and whether to incise vertically or transversely is a moot question. A transverse incision will remain open better while the fingers are extended, and the fingers should always be dressed in extension, but a transverse incision in the lower part of the palm exposes the digital vessels and nerves to danger, while a vertical one higher up imperils the palmar arch.

The patient should be anesthetized and an Esmarch bandage applied. Cut down to the deep fascia and proceed with caution. Divide the deep fascia and then lay down the knife. If the opening has been made over the spot most tender on deep pressure, go straight on with blunt dissection until the pus appears. Do not pack, but insert soft rubber and fasten it in the wound. Any drainage material that presses on a tendon with any force for even a few hours may cause local death of the latter. If a tendon or part of one dies, it takes four to six weeks to separate and come away. Immobilize fingers, hand and wrist, keep fingers in extension, and use the hot bath or moist dressing.

When pus has invaded the great bursa at the wrist, the anterior annular ligament is cut through and the hand and fingers dressed in hyperextension and left so until healing is well advanced.

When the hot bath is used, the part must be kept on the splint while in the bath, and the solution should be as hot as can be borne without blistering. On no account should the temperature of the bath fall below 110° F. In weak patients it is not well to continue the bath day and night, because of fatiguing the patient; therefore during sleeping hours the part, still on the splint, is placed in large, hot packs wrung out of the solution and wrapped in waterproof cover, and the whole surrounded with hot-water bags which are frequently renewed.

If an infection of the palm is properly opened and treated as outlined above, the progress of the disease is quickly checked. The drains are removed in from three to ten days and the wound kept open so that

pus cannot be retained and burrow. Active motion is encouraged for a few minutes at a time two or three times daily as soon as the drains are removed, and gradually these periods of activity are increased and lengthened. Only those too long immobilized or improperly handled fail to regain useful function.

CANCER RESEARCH.

To one who has even casually followed the course of cancer research, an analysis of the results, summed up from his reading, will demonstrate that he is impressed with the extraordinary ingenuity exhibited by laboratory workers, the sometimes elaborate terminology devised by them, and the unvarying optimism and indefatigable energy exhibited in a pursuit which has thus far been not only futile, but not even largely encouraging.

Murray (*British Medical Journal*, Oct. 30, 1920) quotes this somewhat striking sentence: "Cancer research, the knight-errantry of medicine, presents 'a restless complication of bold hazards and miserable disappointments.'" He further states that the cancer cell is in some way different from the cells of the same kind among which it takes its origin and from which it arises. The nature of the change is still unknown. It is probably of a thorough-going kind and in most instances of a quite surprising degree of permanence. Nothing impresses this fact more strongly on the imagination than the behavior of the Jensen mouse carcinoma which has now been propagated continuously in normal mice for twenty years, and is structurally and biologically the same as when first transferred to normal animals.

All the differences which have been found so far between cancer cells and those of adult tissues can be paralleled in rapidly growing tissues of the embryo.

The one positive character of new growths is their progressive proliferation, uninfluenced by the forces limiting the increase of the elements of healthy or

diseased tissues. The transplantable tumors of laboratory animals present this feature and its consequent problem in its purest and most clamant form.

Campbell explains carcinoma on the basis that it is an abortive attempt of the organism to reproduce itself asexually. This implies that the tumor must be regarded as a budding or outgrowth from the organism itself. The epithelial cells, being the least differentiated of all the cells in the body, are those which can most easily be referred to the ancestral germinal type. The conditions favorable to this reversion are degeneration of epithelial cells either from inherited tendency or cessation of function, and abundant supply of nourishment such as comes from local irritation.

Mottram notes that acquired resistance is found in animals that have absorbed inoculated cancer, the second inoculation being invariably negative. If, however, these animals be exposed to *x*-ray, inoculation tumor will result and persist until the effects of the radiation begin to be recovered from. Resistance can be induced against cancer inoculation by the inoculation of various tissues—embryo skin, spleen, blood, etc.—and also by the exposure to small doses of *x*-rays. This induced resistance is likewise destroyed by exposing the animal to comparatively large doses of *x*-rays. It has been seen that these three kinds of resistance have some common feature. In immune animals there is a lymphocytosis, as also there is in the artificially immunized animals. In man lymphocytosis is usually found in the early stages of the disease, but later leucopenia occurs. Profound exposure to *x*-rays causes a profound leucopenia, and at the same time destroys the resistant condition. On the other hand, repeated small doses of *x*-rays give rise to a lymphocytosis and an increased resistance to inoculation.

Russ quotes an experiment made by Murphy and Morten, who collected 52 mice with spontaneous tumors. Their technique was to remove the tumors, give the animals a single dose of *x*-rays, and reinoculate the animals with grafts of their own tumors.

One-half of the autologous grafts failed to grow. Out of 29 controls 28 autologous grafts took.

Leitsch, as the result of his experimental work, states that the susceptibility as well as the resistance is a variable condition. He does not accept the view of Freund and Kaminer that the blood serum of normal or non-cancerous individuals contains a substance capable of disintegrating cancer cells, whilst the serum of cancer patients is devoid of such protective property. From these and other experiments it is to be concluded that an animal does not develop an immunity to its own cells, normal or pathological.

Leitsch holds that the experimental tumors of animals have cleared our minds of many old encumbering fallacies and theories. They have taught us that however attractive speculations may be about the origin and cause of cancer, it is idle to indulge in them. They have helped us to get rid of much useless histological classification of tumors. And they have led us to look upon the neoplastic process as a thing apart—a peculiar response, but only one of the possible responses to widely different stimuli. Every one who has had an extensive experience of tumors realizes how difficult, or even impossible, it is on occasion to separate simple tumors, or even hyperplasias, from malignant tumors.

Apart from the investigation of tumors propagated through animals, which have given results more of academic than of practical value, laboratory researches have been conducted along other lines—(1) methods of diagnosis, (2) essays in chemotherapy, and (3) surgical pathology. There has been a great cry for the earlier diagnosis of cancer. Patients will not seek medical advice before they experience symptoms, and symptoms are notoriously late in obtruding themselves in most cases of cancer. It is remarkable, too, how unobservant some patients are of signs and symptoms when they are well defined. But there is a field for research into possible laboratory methods of diagnosis where, on clinical judgment, it cannot certainly be

made. The very fact that in malignant disease no condition of immunity in the wide sense is ever established would induce one to hope that evidence of antibody formation might be found in the blood serum because the so-called antibodies found in the serum in infectious diseases are probably to be regarded as expressions of injury rather than signs of defence. Crile claimed to be able to diagnose cancer with a fair degree of certainty by the fact that the serum of cancer patients hemolyzed normal red blood corpuscles, whilst the serum of non-cancerous cases produced no such change. It was then known that isohemolysis was a fairly common phenomenon, and it is now general knowledge that all human bloods can be grouped accordingly. He must have worked with rather unusual corpuscles in his tests. At any rate Leitsch found in repeating his work that the method was utterly devoid of any diagnostic value. For the complement deviation action of v. Dungern great diagnostic worth was claimed, and the claims were substantiated by some of his pupils. He employed an extract of carcinoma and subsequently an extract of red corpuscles as antigen, and the reaction followed the lines of the Wassermann technique. Coca, who worked in v. Dungern's laboratory, was unable to obtain successful results or even to have them demonstrated to him in that laboratory. The cancrolytic reaction of Freund and Kaminer has not been of any use to the author. The famous Abderhalden reaction was founded on a very attractive hypothesis; numerous papers from all parts of the world supported its great value in the diagnosis of cancer. The Abderhalden reaction is devoid of any practical diagnostic value.

The whole world, medical and lay, looks for the elaboration of some drug that will cure cancer, and many essays in the chemotherapy of the disease have been made. The experiments of Wassermann and his collaborators with an eosin-selenium compound raised considerable expectations. The details of his experiments were far from convincing to any one familiar with

the behavior of transplantable tumors, and he was apparently never able either to repeat his successes or even to elaborate the same chemical substance again. It is difficult to conceive any chemical substance so selective in its action that it will destroy tumor cells and yet leave uninjured the normal cells from which they have sprung, seeing that chemical analyses fail to show any material or constant differences in constitution or metabolism between the one and the other. X-rays and radium are supposed by some to have this selective property. While one cannot deny that these agents may occasionally produce a local temporary amelioration, reliable evidence is still wanting that they ever bring about cure even in such low malignant lesions as rodent ulcer.

Surgery is, and is likely long to remain, the only means at our disposal of eradicating the disease, but surgical procedures

must be based on sound pathology. There is here a fruitful field for the coöperation of the surgeon and the pathologist. The routes by which the disease spreads have only been worked out with any degree of thoroughness in cancer of the breast, uterus, and rectum, and even there the observations are not complete. Much remains still to be done for other organs, but it is interesting to know that in the situations mentioned the radical operative treatment in the hands of those surgeons who are conversant with the facts of surgical pathology gives a cure rate of about 40 per cent, taking as our standard of cure a five-year immunity from recurrence. Fifteen years ago such a success could not have been hoped for. The surgeons are slow in adopting them, but the results that have attended the operative measures built on pathological findings give encouragement for the future.

Progress in Therapeutics

Medical Therapeutics

The Effect of Thyroid, Thymus and Tethelin and a Meat Diet on Hypertrophy of the Thyroid.

LOEB, in the *Journal of Medical Research* for July-September, 1920, in summarizing his studies on guinea-pigs makes the following statements:

1. In contradistinction to iodine, which does not inhibit compensatory hypertrophy of the thyroid gland in the guinea-pig, feeding with thyroid tablets has a very marked inhibiting effect.

2. This effect is a direct and specific one, and it is not an indirect effect, called forth by the loss of weight which is induced through thyroid feeding. Iodine preparations given simultaneously with thyroid tablets do not counteract the effect of thyroid.

3. Feeding with thymus gland does not

prevent thyroid hypertrophy. It is, however, possible that it diminishes the intensity and frequency of thyroid hypertrophy, although at present this cannot be stated definitely considering the variable factors which enter into the development of thyroid hypertrophy.

4. Repeated injections of tethelin do not noticeably influence the degree of thyroid hypertrophy which follows extirpation of the greater part of the thyroid gland.

5. A diet consisting principally, but not exclusively, of meat given to guinea-pigs during a period of three and one-half weeks does not produce hypertrophic changes in the thyroid gland; such a meat diet does neither prevent nor (according to his preliminary experiments) noticeably increase compensatory hypertrophy of the thyroid gland in the guinea-pig.

Frequent Types of Nasal Obstruction and Their Treatment.

ITTELSON, in the *New York Medical Journal* of October 30, 1920, states that a frequent condition in the nose is an obstruction due to the abnormal condition of the nasal mucous membrane. To perform its function of warming, moistening, filtering, and perhaps regulating the amount of the inspired air, this membrane expands and contracts, thus varying constantly the lumen of the nose. The causes responsible for this variation in dimension of the mucous membrane are often obscure, and to some extent depend on the function that is to be performed. Changes in the atmosphere, chemical and mechanical irritants, and mental emotions—all affect this highly susceptible membrane and cause it to expand and contract. This expansion is due to an increase in the blood supply, which distends the venous sinuses not unlike the erectile tissue elsewhere in the body, and with little or no inflammatory reaction. The term functional obstruction is suggested for this type of cases. There are few individuals who have not occasionally experienced a sudden change from opening to closure and reversely occurring in both nostrils, or more often alternating from one nostril to the other, without any apparent cause.

Inflammation of the nasal mucous membrane is another condition that is frequently responsible for obstruction. Functional disturbance may occur in a normal mucous membrane; more often it occurs in one that has undergone inflammatory changes. Clinically, a chronically inflamed mucous membrane is either hypertrophied or atrophied or without change in size, and it loses its moist pearl-pink color which is characteristic of a normal mucous membrane. The hypertrophy or hyperplasia may be a conservative process, one of nature's efforts to compensate for some loss of function or for some local anatomical irregularity. Thus, large turbinates are found in roomy noses and on the concave side of a deviated

septum. No such utilitarian purpose is evident in an atrophic or otherwise chronically inflamed membrane. One cannot but feel that here the underlying cause is some general systemic disturbance, such as syphilis, gout, rheumatism, or intestinal intoxication. It may be, too, that a disturbed secretion of the ductless glands has some influence. The relation of the erectile tissue of the nose to the gonadal glands has long been noticed. The facies of those with atrophic rhinitis is not unlike those with a deficiency of the thyroid gland. The broad nose, dry skin, and its frequent occurrence in women all suggest this, as well as the fact that the condition is less often seen in patients with hyperthyroidism. In the acute cases of inflammation the individual immunity is an important element. A virulent Klebs-Loeffler bacillus may be innocuous to some, while a bit of innocent dust will in a susceptible person excite the most violent inflammatory paroxysm.

In the treatment of these forms of obstruction much can be accomplished by the correction of any general disturbance, which even a superficial examination will in most cases disclose. Changes in the diet, the prevention of autointoxication, the correction of hygienic errors, and the treatment of any indefinite gouty, rheumatic, glandular or syphilitic conditions do more good as a rule than local applications. In this connection may be mentioned the favorable action of laxatives, potassium iodide, and small doses of thyroid extract carefully administered. If the obstruction is suspected to be of an anaphylactic origin vaccine therapy and protein desensitization might be tried. [With great caution.—Ed.] As for local treatment irrigation is the one most frequently employed. Nichol's nasal siphon is well suited for this purpose, acting as it does more by suction than by pressure. A solution of soda bicarbonate, a teaspoonful to a quart of water, is less irritating than normal saline. There are some nasal membranes on which water in any form acts unfavorably. In these cases an

oily preparation may be substituted. Menthol three grains, ichthyol thirty grains, and petrolatum one ounce, is a prescription that can be freely used and often repeated by patients. Intranasal operations are now undertaken reluctantly. Removal of a diseased tonsil by improving the general health relieves local symptoms. Turbinatectomy has largely proved a failure. There are, of course, exceptions to this as to other rules, but the essential validity of this statement is apparent to all who have seen the passing of what was once a popular operation. Among the exceptions may be mentioned the removal of the hypertrophied portion of the interior turbinate, or of an enlarged posterior tip, which is still done occasionally.

Considerable attention is now paid to the appearance of the septum. Deviation of the septum, particularly if it is of traumatic origin and limited to the anterior portion, does prevent the air from passing through, and there are few operations where the good results are more striking. On the other hand, it must be noticed that some form of septal irregularity is almost a universal condition, and a perfectly straight septum is an anatomical exception. The curves and angles that one sees so frequently on the septum are usually normal and innocent variations occurring coincidentally with some other pathological condition.

Patients have a way of disappearing, and it is difficult to get accurate data regarding many submucous operations. Many of these subsequently show up again at a different clinic or office with the same complaint. The surgeon thus sees less of his own unsuccessful cases and more of those of his colleagues, unsuccessful as far as the functional result is concerned, although the appearance of the septum following such operation is all that could be desired and shows evidence of surgical skill. Many feel that a submucous resection is always a conservative operation because the original incision is small and the mucous membrane

is not sacrificed. In the separation of the periosteum and in the removal of the bone and cartilage considerable trauma is done, which with the subsequent fibrosis often affects the mucous membrane unfavorably. Following the removal of the bone and cartilage there remains considerable redundant tissue which assumes somewhat its former position, and a deviation may persist after operation. Diagnosis of a deviated septum is easily made, but to determine its relative importance in the causation of the obstruction requires careful watching and good judgment.

Bacterial Vaccines — Chloretone Solution as a Vehicle for Their Administration.

OWEN, MARTIN, and BROSIUS, in the *Journal of Laboratory and Clinical Medicine* for October, 1920, state that in a recent article in that *Journal* (vol. v, p. 583) Aldrich and Ward discussed the use of chloretone (trichlortertiary butyl alcohol) and mentioned its anesthetic and bactericidal powers, stating that it would not only prevent the growth of molds, but would kill all but the most resistant spore-bearing germs. It also exerts marked local anesthetic effect with some hypnotic and general anesthetic action. In addition relatively large doses can be taken with impunity.

For several years they have been using a saturated solution of chloretone to wash their bacterial suspension off the agar slants and to dilute the bacterial mass to the proper number. After the desired dilution has been made the vaccine is heated in a water-bath at 55° to 60° C. for one hour and the usual control cultures made. The chloretone will, of itself, kill all the organisms present without heat, but may require several days to do so.

There is no clumping of the organisms as seen when trikresol or carbolic acid is added, and the resulting vaccine is perfectly homogenous, sterile, and remains so. Moreover, its anesthetic properties make

the use of such a vaccine most acceptable to the patient.

It is not necessary to sterilize the chlore-tone solution before use. They simply make up a saturated solution in cold distilled water, keep it for several days, and test to insure sterility. Once sterile it will remain so indefinitely.

Food Values in Tuberculosis.

WOODCOCK and RUSTON, in the *Lancet* of October 23, 1920, in summarizing their article on this subject, state:

1. We find that tuberculous patients require more food than the average amount needed by the ordinary laborer outside. The minimum for Gateforth patients contains 3500 calories, the patients being almost invariably adults.

2. The diet must be rich in protein and fat—protein, 4 to 4½ ounces per head per day; fat, 4 ounces per head per day. We consider that the fat should be largely animal fat, particularly in the form of milk and milk products. If margarine is used it should be as oleomargarine and not made from vegetable fats.

3. Eggs should be in the dietary, and when they are not supplied their place should be taken by an extra amount of meat given according to accurate calculation.

4. Whole-meal bread, beans, peas, and lentils should always be used, together with a plentiful supply of fresh fruits and vegetables grown in the sanatorium grounds.

5. Two pints of milk per day is the amount they suggest for each patient.

Benzyl Alcohol for Toothache.

MACHT, in the *Journal of the American Medical Association* of October 30, 1920, calls attention to what he believes to be a very satisfactory minor use of benzyl alcohol. He has found that benzyl alcohol either alone (100 per cent) or, still better, when mixed with an equal part by volume of chloroform furnishes a most efficient

anodyne for toothache, when introduced on a pledget of cotton into a tooth cavity, or applied to an exposed nerve. The relief obtained by the use of such drops is marked and almost instantaneous, and is also long-lasting. He is not aware of any other drug, with the exception of cocaine, which is more efficient in relieving toothache. As benzyl alcohol is the least toxic of all the well-known local anesthetics, the repeated and free use of such a combination as described above is free from the objections which are raised by the employment of cocaine, and it can be administered with impunity even to small children. It is for this reason that he has deemed it worth while to publish this note in order to advise the medical practitioner of a simple remedy for the relief of one of the most excruciating forms of pain.

Symptoms Resembling Tabes Dorsalis Arising After Antityphoid Inoculation.

BURY, in the *Lancet* of October 23, 1920, states that there is ample evidence that the low percentage of cases of enteric fever in the British army during the recent war was due to systematic inoculation with antityphoid vaccine, and also that in the vast majority of cases such inoculation was quite harmless. Large doses of the vaccine are well tolerated by healthy persons, but this is not always the case in persons who have some morbid taint. The vaccine may light up a latent tuberculosis, may cause a rise of temperature, and a recrudescence of intestinal symptoms in persons who have suffered from enteritis, and may lead to the development of albuminuric retinitis in the subjects of Bright's disease.

Meyer has recorded a sudden death due to edema of the glottis after inoculation in a case of status lymphaticus. Very rarely symptoms of disease have been observed to develop in previously healthy persons soon after inoculation. The sequence, of course, may have been accidental, the ob-

served illness being due not to the vaccine, but to some other agent. A critical investigation of every case is essential, but even then it may be difficult or impossible to decide as to the cause of the illness. The absence of satisfactory proof, however, neither detracts from the interest of the association nor lessens the necessity for putting it on record.

Preoperative Catharsis.

In the *Journal-Lancet* for November, 1920, FANSLER says every one knows how bitterly some postoperative patients complain of gas pains and how even death may result from distention. Any one who has run the gamut of massage, eserine, pituitrin, stupes, enemas, etc., upon an already weak and exhausted patient is perfectly willing to dispense with this form of excitement. Distention of the intestines is due to several factors: first, the abnormal formation of gas, and secondly, the lack of peristaltic power. This relaxation and lack of normal peristalsis are due to several conditions—the opening of the abdomen and the manipulation of the contents, the complete relaxation due to the anesthetic, and the relaxation following the primary stimulation due to the cathartic.

In order to understand the increase of gas formation he outlines the normal process of digestion. The food is masticated in the mouth and mixed with the salivary secretion, which partially converts the starch into maltose and dextrin. In the stomach the fats are partially emulsified, but little absorbed. The proteins and albuminoids are partially digested and partially absorbed, as are also the starches. Most of the fats and a goodly portion of the proteids and starch are then passed on into the small intestine but partially digested. Here the pancreatic juice and bile, together with the secretion of the small intestine, practically complete the digestive process. The large intestines now receive the residue. In the large bowel there is little digestive secretion, and changes in the

material passed into it are largely due to putrefactive processes, which affect chiefly proteids. We have then a general digestive process, each part of the digestive canal being prepared to receive the food after it has been properly acted on by that portion of the digestive tract just above.

Now, what happens when a cathartic is given? The food which is normally passed through the alimentary canal tract in twelve to twenty-four hours is rushed through the intestine in a much shorter time. The small intestine, instead of receiving a well-prepared food for its digestion, receives a food scarcely digested at all. In turn the large intestine, which ordinarily receives very little undigested residue, is insulted with a heterogeneous mass of undigested starch, proteids, and fats. What is the result of dumping such a mass of culture-material into a bacterially infected tube of optimum temperature? Naturally fermentation occurs, with the production of a large amount of gas, which the relaxed intestines pass with difficulty. So much for the general effects.

In rectal work there are certain local effects to be avoided, namely, the unnecessary soiling of the wound, postoperative hemorrhage, and pain. This is best accomplished by confining the bowels for three or four days following operation, thus allowing nature to build up her defenses against infection and to permit the sealing of the capillaries to become complete. This is certainly not well accomplished if the patient is constantly having to pass gas. The wounds are put on a stretch, thus encouraging bleeding. Fecal particles are carried down upon the freshly cut surfaces, all of which contribute to the patient's discomfort, if they do not actually menace the patient's life. Not infrequently the peristalsis and the straining required to pass the gas will also produce a bowel movement, which causes the same complications as flatus, only to a more marked degree.

Personally, he believes that the interest of the patient will be far better conserved if the cathartic is omitted or the patient is pre-

pared according to the following plan: Seventy-two hours before the operation the bowels are cleared with castor oil, for this allows time for the period of excessive gas-formation to pass before the time of operation. In other words, the alimentary tract is unloaded and allowed time to return to its normal condition minus its load of digesting material. Following the ingestion of the cathartic only liquids or food that will leave very little residue is permitted. The evening before the operation the patient is given a high enema of normal saline solution. It should be so given as thoroughly to clean out the lower bowel, for frequently a poorly given enema does not do so. The following morning, two hours before the operation, a copious low enema of warm saturated boric acid solution is given. This is the final preparation before the operation. After the operation the same diet is continued and 4 Cc. of tincture of camphorated opium is given every four hours. By this method the bowels may be confined for several days and undue gas-formation will not occur. At the proper time a saline cathartic and an enema of warm olive oil will insure a soft, easy bowel movement.

Vitamines.

The *Boston Medical and Surgical Journal* of October 28, 1920, in an editorial on this subject, says it has long been known that there were substances in food which are necessary to the development of human well-being which are apart from the heat-producing portions of caloric value of the food. These unknown substances are termed vitamins. Chemists and physiologists do not know exactly what these substances are any more than the physicists can tell what electricity is, but they know what the vitamins can do, or rather what will happen to the person who is deprived of them.

Three forms of vitamins are recognized. The first, the scurvy-preventing or antiscorbutic vitamin, has been recognized

for a long time. Scurvy has been a well-known disease, especially in the time of the old sailing vessels. When Massachusetts was a seagoing community scurvy was common on shipboard, where it was impossible to provide fresh foods and vegetables for long voyages. It became known that lime juice, and fresh vegetables when possible, prevented scurvy or cured it when it had developed. Later, when artificial infant feeding was developed it was found that babies fed on carefully prepared, that is sterilized, milk often did not thrive and sometimes developed hemorrhages resembling old-fashioned scurvy. This condition of the baby, when recognized, was quickly overcome by giving the child orange or other fruit juice.

The vitamin preventing scurvy is known as the antiscorbutic vitamin. It is destroyed in food by heat and oxidization. It can be replaced and scurvy prevented by the administration of fresh orange, lime, or lemon juice; also tomato juice, either freshly prepared or from a newly opened can (for the heat alone does not seem to destroy the valuable vitamin of the tomato). Incidentally, tomatoes have present the two other forms of vitamins and so are specially valuable as a food constituent. This accounts for the great popularity of both fresh and canned tomatoes to-day in the diet of the community. Somehow or other the public has instinctively recognized the need of tomatoes to their well-being and adopted them as part of their diet. The laboratory has demonstrated scientifically the value of the tomato to every one as a palatable solution of all of the vitamins necessary for human well-being, thus giving its approval to the tomato's popularity as a food constituent.

These have been found in animal foods, especially butter-fats. Hence they are found in whole-milk, cream, butter, and cream cheese. Lard alone of the animal fats seems to be deficient in this form of vitamin. The vegetable oils do not appear to carry this very necessary vitamin. It

is also found to be present in the yolks of eggs.

The fat-soluble vitamine is probably needed especially during the growing period of life. It is needed for the complete development of a perfect body. Although the action of this form of vitamine is less understood than either of the others, there is more evidence of likelihood of serious pathological results arising in every-day life from a shortage of fat-soluble vitamins than of the other vitamins.

Like the other two vitamins, the fat-soluble vitamine as a chemical entity is unknown. Recently it has been demonstrated that this fat-soluble vitamine has been found in certain plants such as spinach, tomatoes, and especially in yellow pigmented vegetables such as carrots, peas, sweet potatoes, yellow corn, etc.

The so-called water-soluble vitamins have to do largely, from a practical point of view, with the subtle thing called appetite. The loss of appetite is brought back by the presence of the necessary vitamins in the food, not simply by the increased injection of food or food flavors. That is to say, the vitamine must be present before the food can or will be taken and so utilized in the metabolism, or, in other words, used to build up the body tissues.

The water-soluble vitamine—the appetite-producing vitamine—has been refined out of our sugar, bolted flour, and polished rice; also from our refined oils and fats. It is not found in ordinary meat or fish. No great harm need result from this careful purification of foods which furnish the greater part of the calories used by the average American household, because other forms of food are generally added in sufficient quantities to supply the need for the necessary vitamins. Most people instinctively eat sufficient vitamine-containing foods because milk, eggs and kidneys and liver are animal foods rich in vitamins, and in addition most of the fruits and vegetables also contain the vitamins.

Fresh milk contains all three varieties of

vitamins at present known. The vitamins of the fats are resistant to heat and are constantly present in eggs and milk, and the water-soluble vitamins are also able to withstand heat. On the other hand, the antiscorbutic vitamine is destroyed by raising milk slowly to a degree of heat necessary for pasteurization. Such milk rapidly loses its antiscorbutic vitamins.

It is known from many experiments that no animal can live upon a food which is a mixture of pure protein fats and carbohydrate, and even when the necessary inorganic salts are carefully added the animal still cannot flourish. The animal body is adjusted to subsist either upon plant tissues or the tissues of other animals, and these contain countless substances other than the pure protein starches, fats, and salts.

Three of these active substances have been recognized under the term vitamins: Antiscorbutic vitamins which prevent scurvy; fat-soluble vitamins which favor body growth; water-soluble vitamins which have to do with appetite.

The presence of all three vitamins is essential to bodily well-being, and even though the symptoms of complete vitamine starvation may not be present, nevertheless many vague symptoms of malnutrition often may be due to an insufficiency of vitamins in the diet.

The refined foods for the most part have lost their vitamins; thus our staple foods, such as flour, sugar, rice, macaroni, vegetable fats, lard, and plain meats, are much deficient in vitamins.

Fortunately a comparatively small amount of vitamine is all that is necessary to supply the requisite quantity for the body's development and well-being. All of the essential vitamins are to be found in fresh milk, eggs, coarse flours, most vegetables and fruits, especially tomatoes, oranges, grapefruit, lettuce, spinach, cabbage, cauliflower, and other leafy vegetables; also peas and beans and grapes and other fruits. There is, therefore, no need of worry about a deficiency of vitamins

when foods rich in vitamins are so easy to add to the ordinary dietary.

[Combined vitamins ready for use are now on the market under the name of Metagen.—Ed.]

Influence of Dilution on the Toxicity of Alcohol.

The *British Medical Journal* of October 23, 1920, in an editorial on this subject states that Dr. H. M. Vernon, in 1919, in a study undertaken at the instance of the Central Control Board (Liquor Traffic), investigated the action of 5-, 10-, 20-, and 40-per-cent solutions of alcohol taken in the form of pure alcohol or brandy. The quantities of alcohol consumed were not greater than 30 Cc., and dilutions of less than 5 per cent were not employed. The ensuing impairment of neuromuscular co-ordination was measured by a typewriting test, or by the use of an adding machine, or by target pricking. Using the typewriting test, Dr. Vernon has conducted on himself a further series of experiments. Three and a half hours after food 15 to 90 Cc. of alcohol were taken; in the case of the larger doses the toxic effect was found to increase at a more and more rapid rate, the greater the quantity of alcohol taken; when drunk as 20-per-cent whisky, 18.3 Cc. of alcohol was followed by an increase of 0.8 in the "corrected" number of mistakes, 30 Cc. of alcohol by one of 3.4, 45 Cc. by one of 8.0, and 60 Cc. by one of 17.0. The findings of the former investigation are thus fortified. One of the inferences to be drawn from the more recent investigation is important, and—as a fact established by scientific experiment—new. The toxic effect of alcohol taken in considerable dilution was found to be much slighter than was anticipated, and Dr. Vernon concludes that, "practically speaking, beer containing 3 per cent by volume of alcohol, or 5.25 per cent of proof spirit, is a non-intoxicating liquid." When taken in the form of 3-per-cent beer, 90 Cc. of alcohol produced only as much effect as 54 Cc. in the form of 4-

per-cent beer, as 46 Cc. in the form of 5-per-cent beer, and as 42 Cc. in the form of 20-per-cent whisky. The 90 Cc. of alcohol mentioned is contained in $5\frac{1}{4}$ pints of 3-per-cent beer, and Dr. Vernon calculates that in his own case more than ten pints of beer, which would take him over four hours to drink, would be needed in order to intoxicate. It may be argued that experiments conducted on one person only are open to fallacy; the subject of these experiments conducted on another person eralization that 3-per-cent beer is non-intoxicating by comparative observations which show him to be more susceptible to alcohol than the average man. One set of experiments conducted on another person somewhat less susceptible to alcohol than Dr. Vernon is described; in this subject 65 Cc. of alcohol in 4-per-cent strength had the same effect as that produced by about 49 Cc. of alcohol in 10-per-cent strength.

Dr. Vernon shows the following practical conclusions from his experiments: "In order to bring about an increase of sobriety in the nation, it is clear that so far as possible the consumption of the stronger beers and of spirits ought to be discouraged, and that of the weaker beers and of cider to be stimulated. This object could to some extent be achieved by exaggerating the system of taxation which is already in force. If the taxation of light beer containing 3 per cent or less of alcohol were so reduced that it was possible to sell it at twopence per pint, whilst that of the heavier beers was increased so that beer of 4-per-cent alcoholic strength cost fivepence per pint, and beer of 5-per-cent alcoholic strength one shilling per pint, a very powerful stimulus to the sale of the light beer would be provided. For each penny spent a man would get 8.5 Cc. of alcohol in the form of 3-per-cent beer, 4.5 Cc. in the form of 4-per-cent beer, and only 2.4 Cc. in the form of 5-per-cent beer. Hence from motives of economy he would generally choose the 3-per-cent beer. He might grumble that it was not strong enough to tickle his palate, and occasionally indulge in the heavier

beers, but he would seldom be able to afford enough of these beers to bring him anywhere near to intoxication."

The two beers with which Dr. Vernon experimented contained, before dilution, 5.43 per cent and 3.46 per cent of alcohol by volume. Dr. Vernon found that light claret containing 10 per cent of alcohol, taken with the food, had a slight toxic action comparable with that of 3-per-cent beer taken on an empty stomach; port or sherry imbibed under similar conditions would, as a rule, be rather more toxic than 5-per-cent beer taken on an empty stomach. Claret had the same effect as whisky diluted to an equal alcoholic strength.

Sinusitis in Children.

PHELPS, in the *Journal-Lancet* for November, 1920, states that a diseased sinus may produce local symptoms, or it may act as a focus but produce general symptoms. Every child with meningeal symptoms, an anemia, increase of temperature of unknown origin, or with asthma or nephritis, pyelitis, arthritis, endocarditis, headaches, or long-standing colds, bronchitis, indefinite gastrointestinal symptoms or cyclic vomiting, should be very carefully examined for sinusitis. The most frequent local symptoms are nasal discharge and headache. If it can be established that the headache decreases when the discharge begins, or the headache is worse in the morning or on bending the head forward, it is suggestive of sinusitis. None of his cases complained of severe headache except those with a meningeal lesion. Usually the ache is not frequent nor common. Any child with a known sinusitis in which the headache does not improve on treatment should be watched carefully for signs of meningeal involvement. Sneezing is said to be a common symptom. Tenderness over the sinus, swelling of the eyelids or cheeks, and fistula in the upper or lower lid are suspicious signs of sinusitis. Two of Phelps's cases had a swelling of the forehead between the eyes, which was soft and not tender, yet

was a subperiosteal abscess from a perforating sinus infection.

The rôle of the sinuses as a focus of infection is not so well established in pediatrics as it is in general medicine. More attention should be paid to this relationship, which will require a greater coöperation between the pediatrician and the rhinologist. In this connection Dean has shown that cultures from the sinus which acts as a focus usually show hemolytic streptococci.

Frequent colds was the complaint in 19 cases, most of which were maxillary infections.

Bronchitis occurred in eight cases, and was relieved in all by treatment of the sinuses.

Otitis media was present in five cases; three were cured, and their history extends over several years. The other two required mastoidectomies.

Nephritis in an acute form was present in one case, which cleared up after a sinus operation.

Bronchial asthma in two cases, both maxillary infections, and in both immediate relief followed the treatment of the sinusitis, but the relief was not permanent. He found no recurrence of the sinus infection, however.

Eye complications—3 orbital abscesses, 2 orbital cellulitis with no pus found, on operation or post mortem. Five swelling of the eyelids and one abscess of the lower lid are in this group. Most of these complications were the first symptoms of the sinus disease.

Intracranial complications occur in children more often than is usually considered, for the average case of meningitis is never examined for a sinus infection.

Palliative treatment is successful in the majority of cases when it is directed toward establishing drainage and ventilation. The use of oily and alkaline sprays, inhalations and nasal irrigations, together with suction and a weak adrenalin solution, will often relieve the condition better than an operation. Vaccines are used by some with success.

Should these measures fail the drainage should be increased by removing the obstruction, being careful to destroy as little nasal tissue as possible. The tonsils and adenoids may be removed, and the anterior tip of the middle turbinate trimmed, but never removing the entire turbinate. These measures, like those above, are directed toward producing drainage through the natural orifices and should be tried whenever there is a reasonable chance of success.

In certain fulminating types and in cases not relieved by other methods a radical operation is indicated. This operation is the same as is done in adults, except that no external operation should be done on the antrum on account of interfering with the development of the teeth.

Chronic sinusitis occurs in children quite frequently and may act as a focus of infection.

The x-ray is the best method of diagnosing a sinus infection.

Most cases recover without any radical operation being performed.

The Feeding of Normal Infants.

McLEAN, in the *Medical Record* of November 6, 1920, considers the different articles of food constituting a more liberal diet for an artificially fed infant and the reasons for their use.

In most instances it is well to begin the administration of orange juice as early as three months; one may commence with one teaspoonful daily one-half hour before the second morning bottle. This daily amount may be increased by one teaspoonful each week. At five to six months of age the infant will be receiving the juice of one orange daily, or approximately $2\frac{1}{2}$ ounces. The liberal use of orange juice minimizes the necessity for laxatives so often used in the artificially fed baby to correct constipation. Almost all the milk fed to infants in New York City is pasteurized. Scurvy has frequently been noted in infants fed exclusively on pasteurized milk. Orange juice is one of the richest sources of antiscorbutic vitamine; if begun in small doses and grad-

ually increased, it seems to be well tolerated. Infants six weeks of age have been seen who were given orange juice as a laxative without ill effects.

At the age of nine to twelve months orange juice may be replaced by well-strained apple sauce or prune pulp. These substances add more bulk, are more laxative, and have a greater caloric value than orange juice.

The average artificially fed infant, in the experience of many, thrives better after the sixth month with at least part of his caloric needs supplied by other food than milk. The amount of other food may be increased as age advances. As a rule not more than twenty-eight ounces of milk per day is given, and after the tenth month this amount may be gradually decreased. By the eighteenth month he will usually not need more than twenty to twenty-four ounces per day.

Why is it that an exclusive milk diet for an infant up to twelve months of age is undesirable? Chiefly because of the small amount of iron plus the objection to the large amount of bulk necessary to give the infant sufficient calories. It is probably because cow's milk is low in iron that infants become anemic. Every infant is born with an "iron reserve." If he is breast-fed he utilizes the iron present in the mother's milk and apparently maintains a normal balance. The iron reserve plus the amount he receives from the cow's milk may carry him along a varying number of months until he finally becomes anemic. This frequently begins to be noticeable from the eighth to the tenth month, and becomes more marked as age advances. At that age or earlier he needs a supply of iron from some other source. A sufficient addition cannot be furnished by increasing his supply of milk.

The feeding of cereals may be advantageously begun about the fifth month, generally in the form of strained oatmeal jelly. Oatmeal has much residue to furnish bulk and helps constipation. If begun in small amounts (a teaspoonful daily given just before the second morning bottle) it

may be increased at regular intervals so that by the tenth month the infant is receiving two or three level tablespoons twice a day. Infants vary in their ability to handle starch, but the majority assimilate these amounts without difficulty. Some infants under three months of age with a stationary weight have begun to increase in weight upon the addition of raw starch in the form of barley flour. Infants have been encountered who were doing well on a milk mixture in which the carbohydrate was furnished (through a mistake in interpreting directions) in the form of 50 grammes of raw starch per day.

Morse does not advise the use of eggs before the eighteenth month; he then gives one-half of an egg once or twice a week and gradually increases the amount. It has been frequently noted in feeding infants that it is the egg-albumen which is difficult for the infant to digest. For this reason the administration of egg is begun by using only the yolk, which is high in iron and in fat-soluble vitamins and is not difficult to digest. It may be begun about the sixth month with one-eighth to one-fourth of the pulverized yolk of an egg which has been boiled 20 minutes. This is mixed with the vegetable or cereal, and the amount is increased each week until the child is having the whole yolk of a hard-boiled egg daily. By the eleventh month he may be given part of a whole coddled egg, and if it is well tolerated, as it frequently is, he is given the whole egg, generally by the twelfth month. Pulverized egg-yolk may often be given as early as the fifth month without causing digestive disturbance.

The ever present question is: Is the simple diet sufficiently nutritious? It is beginning to be appreciated that to furnish a properly balanced ration for a normal infant over six months of age is not so easy as it was formerly considered. Little is yet known of the vitamin factor, yet certain facts have been established. Uncooked food has certain antiscorbutic properties not possessed by cooked foods, orange juice has more of these properties than milk, and the drying of milk deprives

it of some of its antiscorbutic properties. Pasteurization also impairs the vitamins, and it has been recently shown that scalding milk is less destructive to the vitamins than boiling for five minutes.

Simple Every-day Science About Yeast.

HIRSHBERG, in the *Medical Record* of October 30, 1920, says obviously the dirty, ugly looking, huge hunks of yeast sold in many shops do not measure up to the necessary, scrupulous cleanliness which is required to avoid the chance of contamination. Yeast, like milk, ought to be certified as to its freedom from germs. It is a complete food, as easily polluted as fresh milk. Unless one can assure oneself that the yeast one eats before each meal and in his bread is made in tanks, pipes, and presses that can be and are sterilized with live steam, one may defeat the great good which pure fresh yeast will generally accomplish.

The small square of yeast which one ought to eat before meals ought to be kept in your grocer's or baker's refrigerator, fresh, firm, effective, active, and with its vigor and growth unimpaired. This is all accomplished, if delivered in its fresh state each day, iced and refrigerated. The long cakes—resembling but larger than bricks of ice cream—are easily sliced with wires into small cakes and wrapped in tin-foil.

The dietetic and health value of yeast has been discovered in recent years, not by careless observers but by some of the most eminent, painstaking, diligent, unprejudiced research workers in the world. Each more or less without the help of the other has found that half a yeast cake a day aids the health, growth, vitality, weight, repair powers, and personal beauty of those who eat it regularly.

Among the unbiased investigations which have brought this to light are such places as Yale University, Rockefeller Institute, Columbia, Jefferson Medical College, Fordham, Johns Hopkins, Minnesota Experiment Station, and the U. S. Government. The investigators themselves are Casimur Funk, the discoverer of vitamins; Os-

borne, Mendel, Levene, McCaskey, Hawk, Berghem, and many others. They have proved that yeast is, like milk and honey, a complete food in itself. It also contains vitamins. It relieves constipation. It adds weight and growth. It helps the red and white blood corpuscles to digest and to destroy the pathogenic germs causing pimples, boils, and other more serious skin troubles as well as those which are mere blemishes.

For infants, yeast is a pabulum superior to all but pure milk, and a great adjunct to boiled and pasteurized milk as a remedy and preventive of scurvy, rickets, backwardness of growth, flabbiness, obesity, and other maladies. Moreover, in adults it helps to ward off beriberi, pellagra, constipation, hemorrhages, certain joint pains from sugar disorders, the deformities of rickets, gout, and other digestive and deficiency diseases.

The Endocrines in Gynecology.

In the *New York Medical Journal* of November 6, 1920, GRAVES states that in the light of theoretical, experimental, and anatomical knowledge, combined with long-continued observations, our general estimate of the ovary as a gland of internal secretion may be briefly summarized as follows:

1. For complete somatic growth and sexual development the normal secretion of the ovary is essential. To what extent the action of the secretion is direct and how far it serves as a balance to other more powerful secretory influences are matters of speculation.

2. During menstrual life, and especially during the years of adolescence, the proper functioning of the ovaries has a very important bearing on the physical and mental character of the individual.

3. Dysfunctions of the ovaries are usually attended with various neuroses. Some of these may be due to the direct disharmonious action of other endocrines, especially those that have an affinity for the

autonomic nervous system. In evaluating these neuroses one must also take into account those neurotic habits which are the result of a sense of physical inferiority, and characterized as a continued endocrinous emotional state.

4. In the adult the ovarian secretion plays a somewhat minor rôle in the human economy, as is indicated by the comparatively slight physical changes that take place after ablation or the natural menopause. This has an important bearing on the question of removing the ovaries during hysterectomy.

5. During adult life the most definite evidence of the existence of a true internal secretion from the ovaries is the occurrence of hot flushes and genital atrophy after ablation. These symptoms point to a balance rather than a direct action of the ovarian secretion.

6. From an organotherapeutic viewpoint, the ovary must be regarded as primarily a homogeneous gland, the essential secreting structure being the interstitial cells. Variations in secretions of different parts of the gland are probably differences of degree rather than of kind. A selective action of the secretion from different parts of the gland is not yet proved, and if it exists is probably quantitative.

7. The therapeutic value of ovarian preparations in Graves's experience may be stated somewhat as follows: All the ovarian preparations exert a specific influence on hot flushes. In this respect the residue is the most intensive, but the difference in efficacy of the various preparations depends to some extent on the idiosyncrasy of the patient.

In the treatment of menstrual irregularities ovarian extracts exhibit an undoubted specific action, but this action is inconstant. In temporary functional amenorrhea, delayed menses, dribbling before and after catamenia, and small clotting, ovarian therapy is fairly reliable, and is at least the best asset that the gynecologist at present possesses for these symptoms. Theoretically for these affections the ovarian action may be enhanced by the addition of thyroid and

pituitary extracts, but of this his personal clinical experience has not been entirely convincing.

For the permanent amenorrheas, especially those associated with pluriglandular disturbances, ovarian therapy has little or no effect on restoring the menstrual function, but is of undoubted value in improving the patient's general health. It is best in these cases to administer the ovarian treatment in considerable doses, separately from the other gland extracts.

In certain types of dysmenorrhea ovarian feeding is efficacious, occasionally brilliantly so, but it is unreliable and often disappointing after giving early promise. In the severe types of dysmenorrhea it is of comparatively little help. For menorrhagia and metrorrhagia ovarian therapy is not indicated.

Arteriosclerosis.

In the *Medical Record* of November 6, 1920, NAMMACK, in referring to the treatment, says it is manifest that there is no routine plan of procedure for an essentially chronic progressive disease like arteriosclerosis. The key-note is individualization, study of the patient with the disease. This cannot be learned from reading text-books or journal articles, nor even taught at bedside clinics. Teachers can only teach what they are, not what they know. Our old friends, General Principles, can be given in the way of advice, by way of prophylaxis, provided we catch the patient early enough in life. After that it will depend on our personal influence over the patient, and his own stability of character, whether we can correct the injurious influence of his environment. Every man is more or less the arbiter of his own fate. The one essential in the diet for a patient is reduction in the amount. Americans eat too much, as a rule, but those who have traveled in German and Scandinavian countries will admit that by comparison we are abstemious, if not penurious, eaters. Meat has been so abundant in this country that few meals are considered complete without an abundance

of meat and sweets. Herbert Hoover deserves the everlasting thanks of this generation, even though he be denied their votes. A diet of vegetables, fruit, fish, bread and butter, and milk, with very little meat, will suffice in most cases. The supposed injurious effects of the lime salts in milk can be avoided by the addition of lime water, which precipitates the soluble lime salts in the stomach, and facilitates their excretion by the intestines rather than by the kidneys. Buttermilk, either from the churn or from the *Bacillus acidus lacticus*, may furnish an agreeable substitute for sweet milk. Balneotherapy demands careful individualization also. Our generation is certainly a bathing one, but it is folly to encourage the morning cold bath to those who do not react glowingly after it, and criminal to advise the Turkish or Russian bath to one with degenerated cranial arteries.

The one drug to which we turn, for the prescription which most patients expect in return for the fee, is iodide of potassium. Its action has been the result of much controversy. Some writers believe that it acts as a vasodilator and thus decreases blood-pressure; others that it lessens the viscosity of the blood. Capps denies that it does either and says that its only benefit is selective absorption of the cellular exudate in syphilitic arteritis. Lemoine believes that iodide of potassium is a therapeutic heresy. Hood states that it is now generally conceded that iodides and iodine have no place in the treatment of hypertension or arterial fibrosis. Nammack's own hypothesis is that salt-poor and salt-free diet should be pushed to the point of removal of the surplus sodium chloride from the body, and to keeping the tissue sodium chloride content at the physiological amount. To help to accomplish this he advocates administering one-per-cent solution of potassium nitrate, of which fifteen drops are to be taken three times a day in half a glass of water until the individual is filtered of his excess chlorides.

Long before the endocrinists held their present sway, it was believed that the thy-

roid secretion and that of the adrenals were antagonistic, and small doses of thyroid extract, half a grain twice a day, were given with benefit to reduce hypertension. But it is not always wise to reduce hypertension. It is perhaps fortunate that our well-meant efforts to accomplish reduction do not always succeed. Nitroglycerin will usually fail, as it is eliminated in about thirty minutes. Sodium nitrite will hold a slight effect for about two hours. There is no question about the efficacy of amyl nitrite in anginal attacks, and many elderly patients are profuse in their verbal expressions of gratitude for its presence at their bedsides at night, or in convenient vest-pocket pearls by day.

Benzyl benzoate has recently been lauded by Macht in angina, and in other spasmodic seizures. He (Nammack) would put tincture of aconite into the hands of a careful nurse, or hospital interne, for use in excessive hypertension, but would want the effects carefully watched, and the results checked by the sphygmomanometer. But the greatest good is done for the patients in Bellevue and St. Vincent's by absolute rest in bed. Karell diet for four days, hot packs, and free purgation, with venesection added in uremic convulsions or coma. Morphine is sometimes invaluable to secure rest at night, but it should never be forgotten that morphine checks all the secretions but one, and that the habitual use of morphine is the beginning of the end. Influenced by the teachings of the late George L. Peabody in the New York Hospital, he has made an extensive trial of amylene hydrate in hot milk at bedtime. Some patients swear by it, many others swear at it. It can be given by rectum when the stomach is intolerant. The Trunecek serum has gone the way of all fads.

The treatment of the latter stages of arteriosclerosis becomes that of the damage done in brain, heart, kidneys, or intestines, and opens up too wide a field to be covered in this discussion. Prevention, by recognizing the disease in its early stages, must after all be our watchword.

Practical Therapeutics in Dermatology.

HAMMOND, in the *Journal of the Missouri State Medical Association* for November, 1920, leaving the most important consideration, that of internal treatment, until last, cites some hypothetical cases and endeavors to apply his more or less routine practical therapeutics.

A case of infantile eczema of the scalp; of the crusted, pustular type. He begins with the following ointment:

Red sulphide of mercury, gr. xv;
Sublimated sulphur, 3vj.
Oil of bergamot, gtt. xv;
Vaseline, 3ij.

This is spread on very thin layers of cotton, and applied to the scalp morning and night. Every other day the affected area is thoroughly cleansed with olive or sweet oil. In the course of a few days suppuration ceases; the active process subsides, and the lesions become dry. The application is then made once daily. When only superficial scales remain, the following salve is used sparingly, with or without covering:

Acid salicylic, gr. xv;
Tr. benzoin, gtt. xl;
Vaseline, 3jss.

Here we have a method which he says should be curative in 75 per cent of cases of this type. There are several little refinements of detail which must not be overlooked. The ointment should be applied on cotton, never with cloth or gauze. This holds good, of course, wherever a salve is used. It is surprising how generally this detail is overlooked. The cotton should be pulled off the roll in as thin layers as will hold together, to avoid undue heating, and the salve spread on it evenly with a table knife. Instead of using bunglesome bandages, a snug helmet can be made from very thin cambric.

Scratching is most readily prevented by the old pillowslip method. A small slip is slit at one end and an opening made at the other, just large enough to allow the head to emerge. Several large safety-pins are placed between the arms and body, and the arrangement is complete.

Unfortunately, the internal treatment of

these cases, as of most skin conditions, cannot be so simply and graphically presented. We are confronted by the vast and intricate problem of milk modification and infant feeding.

There are, however, three or four expedients of the simplest nature which may be tried, and in a goodly percentage of the cases with very gratifying results.

The greater number of these children are overfed. A reduction of the diet of from one-fourth to one-third the total amount alone may turn the trick. Often one-half grain of calomel administered in a single dose every other night to babies of from six months to one year acts almost as a specific. A small dose of one of the potassium salts, either in solution or as supplied in some of the baby foods on the market, is a valuable remedy. When the children are undernourished one of the simplest and best additions to the diet is one or two tablespoonfuls three times a day of a gruel made from whole rolled or crushed wheat which has been thoroughly cooked and mashed through a fine sieve.

One of the most intractable though apparently trivial conditions met with on the face is the deep vertical fissure which sometimes occurs in the center of the lower lip. He has known these fissures to persist for many months and to present an aspect very similar to that of a beginning epithelioma.

Ordinary applications are quite often without avail. The immobilization of the part with a narrow strip of adhesive plaster usually accomplishes a cure in a few days. The constant application of an ointment containing phenol, calamine, zinc oxide, and cold cream under the plaster is a useful adjunct.

Turning to a manifestation of the same disease of much greater magnitude, he considers a general, acute, erythematous eczema of a highly aggravated type.

Here, obviously, the local treatment would be of secondary importance. It is surprising, however, how many sufferers present themselves who have been endeavoring to alleviate their discomfort by coating

themselves with vast quantities of salves and lotions.

The first step toward relief must be prompt and vigorous elimination. Nine times out of ten a saline has already been taken, and as often without result. A capsule containing 5 grains each of blue mass and compound extract of colocynth, with 1 grain of powdered ipecac, at night, and repeated the second night after, will be far more effectual.

When there is pronounced digestive disturbance a rhubarb and soda mixture should be given. The usual formula employed is:

Pulv. rhei, 3j;
Pulv. ipecac, gr. x;
Sod. bicarbonate, 3iv;
Aq. menth. pip., ad 3iv.

To this it is the custom to add an ounce of potassium acetate, to increase the alkalinizing effects of the soda.

In the other cases where digestion seems unimpaired, and especially in plethoric individuals of excess weight and high blood-pressure, aconite seems to do a great deal of good. It is combined usually as follows:

Potassium acetate, 3j;
Tr. nux vom., f3iv;
Tr. aconite, f3vj;
Fl. ext. rumicis rad., q. s. ad 3iv.

This would seem to be an excessive amount of aconite, but no disturbing symptoms have been observed with it used in this combination.

In addition to chloral, hyoscyamus and cannabis indica, used as general sedatives to allay itching, especially at night, or a pill of atropine and pilocarpine, seems in a great many instances to work wonders. Instead of experimenting with the rest he starts with the atropine and pilocarpine pill, 1/100 of a grain of the former with 1/4 grain of the other, one pill being given at bedtime, and a second, if necessary, an hour or so later.

It may be objected that these two drugs are directly opposed to one another in their physiologic action. The fact remains, however, that together they will accomplish what neither one will separately; and the unpleasant effects of both are offset in the combination.

The Use of Benzyl-Benzoate in Seasickness.

In the *California State Journal of Medicine* for November, 1920, GLENN states that the efficiency of benzyl-benzoate in the relief of spasms of the smooth muscle tissues has been amply confirmed. Many of us have seen marked relief follow the administration of this drug in dysmenorrhea, cardiospasm, pylorospasm, pain in gastric ulcer, and in certain forms of asthma. Hiccoughs yield to its use, and recently Macht has reported good results following its use in whooping-cough.

The striking results obtained in the above conditions led the writer to suggest the use of benzyl-benzoate in seasickness.

An opportunity to try out this drug in seasickness came when his secretary decided to take a boat trip from Los Angeles to Seattle. At his suggestion she took some benzyl-benzoate along.

Soon after leaving Los Angeles harbor she became ill, took ten drops of benzyl-benzoate and received almost instant relief. At night, when she returned to her room, she found the woman in the upper berth violently ill. She was given ten drops of the drug, and almost at once the groans and vomiting ceased. The woman was so still during the night that his secretary was afraid that she had killed her, and was greatly relieved when she awoke the next morning to find the woman perfectly happy.

A telephone operator desired to go to Catalina for her vacation, but feared the trip as she had always been seasick when riding on a steamer. At his suggestion she took benzyl-benzoate along. She became ill soon after leaving the harbor and took ten drops of the drug. Her symptoms disappeared very rapidly, and she enjoyed a sea voyage for the first time in her life.

The author's wife was attacked with seasickness soon after leaving Catalina. She was so ill that it was with difficulty she could swallow ten drops of the benzyl-benzoate in water. The effect, however, was immediate. The desire to vomit disappeared and she was able to enjoy the remainder of the voyage. Several others who

had been attacked with seasickness on the ship were given ten drops of the drug with instant relief.

While the number of cases in which benzyl-benzoate has been used in seasickness at his suggestion has been small, about twenty in all, the result in every case in which it has been used has been so satisfactory that Glenn feels justified in recommending the use of this drug in all cases of seasickness.

In his cases ten drops of the drug were used, a small dose. One-half to a teaspoonful can be given with safety. As the sea voyage was short in all cases, he was not able to determine how long the effect of the drug will last. The results in his cases have been uniformly good and warrant a further study of the effects of benzyl-benzoate in seasickness. It may be that in benzyl-benzoate we have a drug that will make many a seasick victim happy.

Recent Advances in Obstetrical Practice.

POLAK, in the *New York Medical Journal* of November 13, 1920, states that while it has been contended by those who are making routine vaginal examinations that it is safe under proper precautions to enter the vagina at will, or at least as freely as is necessary to follow the advance of labor, his experience has shown that not only the morbidity but the mortality has actually been reduced by the adoption of routine rectal examinations. The vulva and vagina are the constant habitat of bacterial flora which are readily carried into the uterus by vaginal examinations. This can be absolutely prevented by confining explorations to the rectum. One can follow the course of labor by rectal touch after very little experience, and determine the dilatation of the cervix, the descent of the head, the rotation of the vertex, with almost as much accuracy as by vaginal feel. Only when the progress of labor has become arrested is it his custom to make a vaginal examination. When this is necessary it should be made a surgical procedure. The patient's vulva is clipped, scrubbed, and sterilized. The ex-

amining hand is scrubbed and gloved, and with the patient under an anesthetic a careful examination is made and the cause of the dystocia determined. Besides this, an accurate knowledge of the physiological processes of labor is essential, for labor is a mechanical process.

In the ordinary obstetrical case when the woman falls into labor, if she is a primipara and there is no disproportion, the head should be in the pelvis; while in the multipara, during the stage of dilatation, or shortly after dilatation is complete, the head either engages in the pelvis or it does not. This is fundamental. It would engage if it could, and if it does not there is some defect in the power, the passage, or the passenger. Consequently every labor must be studied and conducted by our knowledge of the presentation, position and posture, the preservation of the membranes, the maintenance of absolute asepsis, and the conservation of the nervous energy of the patient by rest.

Should intervention be demanded in the interest of mother or child, such operation can be done with the greatest margin of safety. Anodynes and analgesics are absolutely necessary for the patient's comfort in every prolonged labor; for certain mechanical processes must be effected in order that the child may pass through the pelvis, and these take time and require active labor pains; and pain exhausts. The steps of the mechanism occur after there is dilatation of the cervix and the presenting part passes the brim and reaches the pelvic floor; this in turn is followed by dilatation of the vulvar outlet. When the head passes out of the cervix, the uterus molds itself about the child, and this interferes with the uteroplacental circulation, hence the importance of an accurate record of the fetal heart, its action under the influence of uterine contraction, and its reaction during the periods of uterine rest, are essential in order to estimate the effect of labor on the child.

With this knowledge, should the necessity for operative intervention arise, the woman is reasonably safe, for the child is in good condition, the woman's strength is

not exhausted, infection has been minimized, and sufficient time has been given to accomplish the opening up of the soft parts by nature's processes, consequently it may be deduced that every obstetrical case, unless the delivery is spontaneous, will fall into one of two general classes, namely, either the child will come into the pelvis, and providing the outlet is ample, allow of infravaginal delivery, or it will fail to enter the pelvis, when supravaginal delivery will be necessary.

In the first class, where infravaginal delivery is possible, certain essentials must be observed in order to have a favorable outcome. First of all, the cervix must be fully dilated, and this takes time; to give this time to the patient and yet conserve her nervous energy requires the use of anodynes. Here morphine and scopolamine used judiciously have given the greatest comfort to the woman, and have accomplished much which could not have been done without their aid.

Secondly, the membranes should be preserved until complete cervical canalization has been accomplished. The patient's comfort may be further advanced by keeping both bladder and rectum empty. A tight abdominal binder aids materially in crowding the head into the pelvis besides maintaining flexion, and it further maintains a better driving axis for the force of the pain. Not until the head has reached the spines or has passed them should forceps be resorted to, for in good practice to-day median and high forceps are seldom if ever used. Both of these procedures have a high fetal mortality. On the other hand, low forceps is a life-saving operation, and should be frequently employed, more frequently, perhaps, than at present, when the head is at the spines or below them and the cervix is fully dilated, and the outlet is ample; for many children lose their lives after they have reached the pelvic floor by too long delay in the perineal stage. Furthermore, the fascial sheets become overstretched and pelvic relaxation follows. Both Pomeroy and DeLee have called attention to this and have suggested prophy-

lactic forceps and perineal section in the interest of the child. The perineal section may be done through the median raphe or laterally, and so remove the soft part dystocia which is jeopardizing the fetal life.

Probably no advance in obstetrics has been so great as the recognition of danger to the child by routine auscultation of the fetal heart, done at regular intervals throughout the entire perineal stage. This means we are able to recognize cord complications, as coils, short cord, and shoulder cord, by the arrhythmias and souffles, and to terminate labor promptly in the interest of the child. Only in funnel pelves where the outlet is contracted, namely, when the bi-ischial and posterior sagittal diameters total less than fifteen, is infrapelvic delivery of the engaged head by forceps absolutely contraindicated. It is here, with a contracted outlet, with the head well in the pelvis, at or below the spines, and a living child, that pubiotomy has its principal indication. Hebosteotomy is also permissible in occipitoposterior positions of the vertex arrested at the pelvic outlet by contracted hard parts.

Differential Diagnosis Between Disorders of the Pelvic Organs in Women and of the Abdominal Viscera.

MONTGOMERY, in the *New York Medical Journal* of November 13, 1920, states that pregnancy often affords a cause for error in diagnosis of appendicitis. If a tumor is a fibroid, a subperitoneal one, as the uterus increases in size such a tumor may be squeezed between the developing uterus and the bony pelvis or abdominal wall, and the pressure thus induced leads to its being pressed into the uterine wall like a cork in a bottle until its circulation is cut off and it begins to set up inflammation as a foreign body. The pain, tenderness and muscular rigidity frequently lead to the diagnosis of appendicitis. He has seen three such patients, two of whom were subjected to operation for supposed appendicitis. In the third case, recognizing the condition, he

attempted to carry the patient along by pushing up the uterus to release the pressure, but the condition caused an abortion, and the local state had become so disturbing as to later require an abdominal hysterectomy.

Ordinarily in acute appendicitis complicating pregnancy, the cecum generally being somewhat fixed, the gravid uterus lies in front of it, and consequently the pain may be aggravated by making pressure over the uterus or in pushing behind the uterus. In a fibroid causing the condition the pressure and pain are more anterior to the position of the appendix.

Treatment of Displacement of the Uterus.

BLAND, in the *New York Medical Journal* of November 6, 1920, in summarizing his paper on this subject, writes as follows:

1. Therapeutically there is a distinct need for a specific line of division between medical and surgical malpositions.

2. The symptomatology of uterine displacements, in general, as taught to-day is erroneous. This is confirmed by the small percentage of so-called cures following operation.

3. Uncomplicated malpositions should be treated by medical and mechanical means. Operative measures should be applied to those associated with distinct surgical complications.

4. Operative intervention should not be utilized in the simple malpositions of virgins or young married women.

5. The infantile uterus never requires nor is the condition benefited by surgery. Endocrine dysfunction as an etiological factor should be remembered. This condition should be treated and not the uterus.

6. Nerve and muscle relaxation (backache) should be regarded as a causative factor and not the result of uterine malposition.

7. Restoration of nerve and muscle power should be done in all cases, and

is best accomplished by rest and generous feeding.

8. In no case of retroflexion or retroversion will the patient recover in the presence of obstinate constipation or bladder overdistention. Overcome constipation, and malpositions will largely disappear.

9. The prolapsus of old women with low surgical resistance is best treated mechanically by the Menge pessary.

Removal of Adenoids in Infancy.

TOD, in *The Practitioner* for November, 1920, states when removing adenoids under the age of six months, especially if the baby be undersized or ill-developed, a general anesthetic is neither required nor advisable. The infant is held in a sitting position by a nurse, a small curette is passed up behind the soft palate into the postnasal space and brought down with one sweep.

Owing to the small size of the postnasal space, it requires but a tiny pad of adenoids to give rise to symptoms, but in some cases one is surprised at the amount of adenoids removed. As a rule, very little bleeding takes place, and there is rarely any shock, but the infant should be kept warm, and if there appears to be any shock, should be given a drop or two of brandy in a little milk.

It is advisable not to feed the infant for three hours before the operation takes place, so that it can be given the breast or bottle within ten minutes or so after the operation has taken place.

He has frequently performed this operation on infants, the youngest of which was but three weeks old, and he has never observed any harmful results in consequence. On the contrary, almost immediate benefit will be noted, as the child soon begins to breathe normally through the nose and to suck with comfort; otorrhea and bronchial symptoms, if present, rapidly disappear, and the weakly infant thrives and becomes strong.

For these reasons he strongly urges that

adenoids should be removed, no matter how young the infant may be, whenever they give rise to any symptoms which may adversely affect its immediate or future welfare.

The Placental Gland and Placental Extract.

In the *New York Medical Journal* of November 13, 1920, BANDLER states that the great and complex metabolic changes of the body in its normal state yield to important metabolic alterations in the pregnant individual, and without attempting to solve or even explain the intricate processes which have yet to be discovered, we are therapeutically depending more and more on our conception of endocrine aberrations to aid in the solution; and as the thyroid gland is, to his mind, one of the important protecting organs, especially over the renal epithelium, it is only necessary to conceive of a myxedematous change in the renal epithelium and in altered kidney function produced by the posterior pituitary, to furnish ourselves with at least an outline of some of the changes occurring in the so-called pregnancy kidney. A like change in the cell membrane of Gley would serve to explain many of the cerebrospinal symptoms in the pre-eclamptic and eclamptic states. It was a study of this condition that attracted his attention to that form of headaches so peculiarly typical in women, the headaches in the occipital region radiating behind the ear and down the cervical spine, associated with soreness and stiffness. He set out with the idea that these changes—which are so often premenstrual, but not always—may be due to altered activity of the posterior pituitary (though possibly in part to a swelling or hyperemia of this structure), but more probably due to some interference with osmosis, the cell membrane of Gley, and the spinal nerve roots.

While some were helped by thyroid and some by corpus luteum, he has found that in a number of cases placental extract gives surprisingly effectual results; and when with peculiar headaches of this type we

find not infrequently psychic disturbance characterized by restlessness and inability to be physically or mentally quiet—a typical mental wanderlust, as we might call it—it is the first thought to attribute both to the same cause, and if this be true, what stretch of the imagination is it to conclude that mental wanderlust, without these typical headaches, may be due to the same cause? Only by dissociating associated phenomena can we lay the finger of investigation on many of our puzzling problems. Furthermore, when by the therapeutic application of placental extract the physical manifestations disappear and the psychic peculiarities often improve noticeably, the test of therapy justifies the conclusion that the primary conception was correct.

Since in many of these cases the blood-pressure was above normal, a test was made concerning high blood-pressure in general, and it became apparent that a number of the endocrines enter into the causation of high blood-pressure in many cases, and metabolic changes occurring in the body serve as an explanation for the apparently contradictory basic theories. Hence it is apparent to him that there are no one, two, or three endocrine causes of high blood-pressure, but that each individual with this symptom must be viewed as a distinct entity, and the gland aberrations of that individual must be sought for and disclosed, of course, first taking physical states into consideration.

Pursuing this plan from the basis of menstruation alone, and treating the conditions of amenorrhea, menorrhagia, metrorrhagia, and dysmenorrhea by endocrines, not infrequently he noticed a reduction of the blood-pressure, even though no attempt at a solution of the primary cause was in mind at the time; and taking a large number of patients at the climacteric period and noting their symptoms after this basic experience, the fact was likewise disclosed that in many cases the blood-pressure was noticeably reduced.

Considering this material, the fact stands out that thyroid minus and pituitary plus explain a certain proportion of cases of high blood-pressure. When this is traced

back to the domain of physiology, it suggests the influence which the thyroid and the pituitary probably have on the cerebrospinal fluid, and on the kidneys and their excretory function; but to state that a pituitary minus may not be associated with high cerebrospinal fluid pressure is to disregard entirely the metabolic changes associated with endocrine activities and to overlook the relation of either plus or minus pituitary to the osmosis and interchange in the cerebrospinal fluid. For while diabetes insipidus is attributed to pituitary minus, he is inclined to believe that in some cases pituitary plus increases the urinary output. So, reviewing the theoretical, the physiological, and the therapeutic conditions, he has become satisfied that we have in placental extract a substance which should be ranked among our therapeutic agencies as worthy of study. If posterior pituitary does half the harm for which, in his opinion, its over-activity is responsible; if placental extract does only half as much as he has gleaned from his therapeutic endeavors, he feels that he may still safely suggest that the important factor concerning placental extract is its ability to influence the posterior pituitary and to stimulate the anterior pituitary and the adrenal cortex.

The Treatment of Exophthalmic Goitre by Radiations.

BURROWS and MORISON, in the *Proceedings of the Royal Society of Medicine*, state that the immediate effect of irradiation seems to be an inhibition of the secretory function of the gland, and the pulse-rate will rise again after an interval if no further treatment be given. Prolonged treatment sets up a more permanent fibrotic process, so well seen by surgeons who attempt excision of part of the gland after prolonged x-ray treatment. This is possibly an exaggerated manifestation of the normal process of auto-recovery.

Severe cases of exophthalmic goitre usually follow a severe nervous cause. The thyroid gland is not necessarily greatly enlarged. Moreover, it is possible that the

quality as well as the quantity of thyroid secretion is changed. Removal of the thyroid factor may still in bad cases leave behind ameliorated, but still severe, nervous symptoms such as palpitation, exophthalmos, and indigestion or diarrhea, though not usually the last. These symptoms, however, commonly abate a great deal as time goes on. It is in connection with these cases that the interval of complete stoppage of both x -ray and radium treatment already mentioned is so useful. Here a warning may with advantage be uttered against too rigorous a rest and dietetic treatment being insisted upon in chronic cases, for it may engender in the patients' minds a feeling of depression and hopeless chronic invalidism hindering rather than aiding recovery. They should return as nearly as possible during that interval to normal life.

The most notable features to be observed in judging the progress of a case are as follows:

The first sign of improvement is a feeling of well-being. This can usually be recorded by the end of the third week. The patient gains confidence and is anxious to continue treatment.

The pulse-rate as a rule, after a quick drop followed by a slight rise, gradually gets slower. It may fall as low as sixty beats per minute sometimes, but they have not seen a case of artificially produced myxedema after even the most prolonged and severe treatment: If this is possible, and such cases are reported, it is obvious that the radiologist has an excellent method at command for stopping hyperthyroidism. Not infrequently some slight quickness in the rate of the pulse may remain, together with a little palpitation. The screen examination of a large number of hearts in exophthalmic goitre, and the estimation of the condition of the left ventricle by the triangulation method, point to permanent damage occurring in a number of cases. In mild cases the heart muscle maintains its tone, and there is little or no trouble with the cardiac condition after the hyperthyroidism is cured. In medium cases of long standing and in severe cases the heart

muscle loses tone. The screen examination presents the typical appearance of the "lying down heart," the cardiographic index increasing from the normal 7 to 14 mm. to 20 to 25 mm.

Thyroid secretion in association with the sympathetic nervous system increases catabolism greatly. Hence loss of weight is a prominent feature of exophthalmic goitre—failure to assimilate food is another factor. Examination of the intestinal tract by means of "the bismuth meal" reveals no constant nor definite lesion beyond a marked "intestinal hurry" in certain cases. Increase in weight is the best indication of good progress toward recovery, and with ray treatment it is often a remarkable phenomenon. In fact some patients justly complain of getting too fat, a sure sign that the catabolic processes are diminished and that food is better assimilated.

No particular symptom or sign goes first, but all gradually diminish, except that exophthalmos is the last to go, or may be the only sign to persist in a virtually cured patient. When the thyroid enlargement is not of long standing it steadily grows smaller under treatment and after.

Intercurrent infections and attacks of diarrhea delay the favorable progress of a case.

In all cases in which there is a definite focus of infection, whilst some improvement may be obtained by x -ray and radium treatment, no satisfactory progress will take place until the source of infection is removed.

The red blood corpuscles and the hemoglobin index are normal except in those cases associated with secondary anemia. There is little alteration in the total number of leucocytes, the tendency being toward a slight increase in our cases. Other observers state that a mild leucopenia may exist. The differential blood count nearly always shows a diminution of the polymorphonuclear leucocytes and an increase of the lymphocytes. They do not find that it bears any definite relationship to the severity of the disease or to the progress of the case under treatment.

The Treatment of Antepartum Hemorrhage.

In the *Proceedings of the Royal Society of Medicine* for November, 1920, TWEEDY states that it is an error to consider all antepartum hemorrhages other than those arising from placenta previa as accidental, yet this is a mistake commonly made by nurses and students. Of still greater importance is it to determine the amount of loss which brings the condition within the category of accidental hemorrhage. The standard at present varies in the compilation of different statistics and comparison of results is rendered difficult.

In the Rotunda Hospital the term is now not used unless the bleeding is sufficient to necessitate the presence of an assistant master, who has to make a diagnosis and is responsible for the woman's delivery. He is not summoned unless his presence is required in the interest of the patient, and many insignificant bleedings escape being recorded. Thus the fact is explained that during his entire mastership he reported but forty-nine cases of accidental and forty-five of unavoidable hemorrhage in 13,924 deliveries, and in the extern maternity forty-seven in 15,543 deliveries.

On the other hand, Sir William Smyly, in his first hospital report adopting a different standard, records forty-four cases in 3600 deliveries. Most of them, he writes, were of little consequence. Similarly St. Mary's Hospital, Manchester, encountered 105 cases of accidental hemorrhage in the two years 1913-14, eighty-three of which recovered under the measures applicable for the condition in its less severe form, namely, rupture of membranes, etc. Seven died in spite of this treatment, and fifteen were dealt with by more radical procedures. From these figures he infers that there were certainly twenty-two serious hemorrhages, but the remainder could probably be classed, with Sir William Smyly's cases, as "of little consequence."

Amongst his forty-nine patients, twenty-two were in serious danger and were treated by the vaginal plug. He lost two of

his hospital patients, and in the extern maternity seven, a not surprising difference when it is remembered that greater difficulties are encountered in district work and the smaller experience of those in charge of the extern maternity. The plug was employed in five of the extern maternity deaths. His two deaths probably arose from intraperitoneal hemorrhage, for in one it is remarked that not more than a pint and a half of blood poured into the uterus, whilst in the other the notes say that the patient's condition improved whilst the plug was in. Labor started and the delivery was natural in three hours. She died after completion of the third stage.

In 1915 he returned to the Rotunda, and, in conjunction with Sir William Smyly and Purefoy, carried on the work of the institution for three years. They encountered twenty-three cases of accidental hemorrhage. They were then in possession of the knowledge that accidental hemorrhage might arise as the result of pregnancy toxemias, and this knowledge made them decide to perform Cæsarian section when the double complication was encountered in a severe form. They carried out the procedure three times with success. Intra-abdominal blood was observed in all three operations, and in one the ovarian artery beneath the Fallopian tube was bleeding. Of the remaining twenty-one, eight were plugged. No deaths occurred from loss of blood. One woman died from sepsis ten days after delivery. Thus his hospital experience comprises seventy-two cases in over 18,000 deliveries, with two deaths. Thirty were plugged. Smyly, working in the same institution, had five deaths in 3600 patients treated before his adoption of the plug.

These figures are convincing in their significance, and can only be explained on the assumption that the plug exercises a definite and pronounced influence in arresting hemorrhage. It does so by impeding the circulation in the uterine vessels. Various other explanations have been given of the plug's action, and many of these by their inaptitude have greatly prejudiced the

method. Many suppose that a back pressure on the blood-vessels is caused by the outpoured blood above the plug. This explanation is quite inadequate and justifies Berkeley and Bonney in writing that "on first consideration the logic of plugging the vagina to arrest bleeding that is going on some distance above it may not appear obvious, yet its efficacy in cases with free external hemorrhage is proven." These writers satisfy themselves that the efficacy of the plug depends on its increasing the power of the uterus to contract. When dealing with concealed accidental hemorrhage, however, with the accompanying uterine inertia, they are driven to express a doubt whether the plug can have any directly useful effect. They say "it is easy to apply" and that it has this great advantage, that it avoids rapid emptying of the uterus, a proceeding which always impresses severe shock on these patients. "We think there can be no doubt that in some of these cases the bleeding has stopped by the time the practitioner comes on the scene, and that plugging the vagina has the great advantage of compelling him to pursue a course of masterly inactivity."

A plug applied in the method recommended by these writers will not compress the vessels, for they apply it with the aid of a speculum and a forceps and use for this purpose rolls of cotton, each tied round with a string to facilitate removal. Tweedy feels sure it would not be possible to place in position one dozen such rolls as are portrayed in their illustration, and those adopting any similar technique must meet with disappointment.

He has quoted from the work of the above authors, not because they are singular in their views, but for the reason of their great eminence. They undoubtedly voice the popular opinion—*i.e.*, that it is useless to attempt the compression of blood-vessels by a vaginal plug.

On the other hand, he maintains that compression is accomplished with the plug which he applies, and has demonstrated this truth during the performance of several Cæsarian sections. These have afforded his

assistants an opportunity of directly observing stoppage of pulsation in the uterine artery whilst pressure is made from below on a lateral fornix.

To plug efficiently the left hand should be passed into the vagina with the palmar surface directed toward the hollow of the sacrum, while the tips of the fingers lie behind the cervix. Small pieces of cotton-wool, squeezed out of lysol solution, and each the size of the thumb knuckle, are then taken and inserted by means of the right hand round the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of still another plug. This process is continued in a systematic manner from above downward till the vulva is reached and the vagina can hold no more. A T-bandage is applied to keep the plug in position, and an abdominal binder is fastened tightly from above downward to press the side walls of the uterus against the vaginal dam, and this completes the operation. A plug so applied will cause immediate cessation of hemorrhage, and when it is removed after the lapse of hours, so much blood only will be found as can be accounted for by the flow which took place during the operation.

The vaginal plug is not easy to apply, nor is its application harmless. Sometimes, in spite of our best efforts, we cannot at the first attempt insert sufficient material to stop the bleeding. In such cases the plug must be removed entirely and reinserted. On the second attempt the procedure will be found to have become much more easy on account of the dilatation of the vagina. Pain, distress and some shock always follow from its application, and superficial tearing of the mucous membrane of the vagina is almost certain to occur, whilst the possibility of rupture of the uterus is not to be discounted.

It is clear that the words "vaginal plug" mean in Dublin something different from that which they mean elsewhere, and critics must take this into consideration.

To what extent intraperitoneal hemor-

rhage can be controlled by a vaginal plug is still a matter of doubt. In the vicinity of the internal os, control is complete. On the other hand, it would utterly fail to stop a leakage from the ovarian artery. The latter supplies a relatively small amount of blood to the placenta, chiefly flowing to its upper portion where detachment is rare. When the main supply is cut off the loss of blood-pressure promotes coagulation in the sinus.

Hysterectomy has no place in the treatment of accidental hemorrhage, and finally it may be stated that rupture of the membranes does not contraindicate the vaginal plug.

Iodoform Poisoning.

GROSSMAN, in the *Medical Record* of November 6, 1920, in commenting on a case of his own, states that it was unusually interesting and instructive because the patient presented Kernig's sign, headache, hyperesthesia and a papular eruption. Iodoform poisoning from the small amount contained in a strip of 3 or 4 inches of gauze used as a patch in mastoid disease indicated an unusual susceptibility to the drug. Two possible channels of absorption may be considered: (1) From the wound directly; (2) by drainage through the Eustachian tube into the pharynx, and the poison then being swallowed into the stomach. The difficulties in diagnosis are obvious. The possibility of sinus thrombosis, meningitis, and brain abscess complicating operation upon the mastoid had to be carefully considered. Sinus thrombosis was ruled out by the irregular temperature, the absence of chills, the absence of local signs (dilatation of the superficial veins, edema of the eyelids, cyanosis, exophthalmus, and signs of extension into the jugular vein), and the negative blood culture. Brain abscess in the temporal lobe was excluded by the absence of any signs pointing to involvement of the left temporal lobe, as word deafness or sensory aphasia. The absence of any signs pointing to involvement of the pyramidal tracts or the cranial nerves.

The normal fundi, the absence of intracranial pressure, and the absence of ataxia, nystagmus, rigidity of the neck, adiadochokinesis, and asynergy made a cerebellar abscess rather unlikely. Septic meningitis could not be ruled out until the spinal fluid was obtained. The normal spinal fluid immediately cleared up that suspicion. The prompt subsidence of the symptoms on the removal of the iodoform gauze, the characteristic protracted convalescence, and the presence of a positive reaction for iodoform in the sputum twelve days after the gauze had been removed point very strongly to the iodoform intoxication as the agent responsible for the symptoms in this case.

With the exception of hyperesthesia, no other sensory disturbances were present at any time. It is difficult to explain absence of the knee-jerks. The extreme hypotonia may in part be responsible. Souques has noted general absence of tendon reflexes in cases with wounds of the cranium involving the meninges. This, he believes, is due to mild infectious meningitis which passed unnoticed, and of which increase in pressure and albumen content in the spinal fluid were the only evidence. The marked Kernig in the presence of extreme hypotonia is also an unusual phenomenon.

[The interesting question arises as to whether the symptoms were due to iodoform or septic absorption.—ED.]

The Role of the Rectal Examination in Obstetrics.

PARKE, in the *New York Medical Journal* of November 6, 1920, asks: What advantage do we gain from this method? From the point of view of the patient, we avoid pushing any germs from the lower zone of the birth canal to the upper. An examination shortly before the completion of the second stage is less deleterious than repeated examinations over a period of twenty-four hours or more. From the doctor's view-point there is this to be said: There is no diversity of opinion as to the propriety of using sterile gloves, or in lieu

of that, preparing the hands as if for an operation, or indeed of doing both when making vaginal examinations. This takes time and, in winter especially, is hard on the hands, and soon causes chafing or worse. If one adopts the rectal method of examination it is necessary only to put on a clean rubber glove—it need not be sterile—apply a lubricant and insert the finger into the rectum and thus acquire all needed information without loss of time, or skin in scrubbing. By all needed information Parke means that we learn that the labor is progressing normally or, on the other hand, that it is not progressing normally, and some aid will have to be given. In the latter event, of course, he makes a vaginal examination, since one is going to work through the vagina.

He concludes there is a distinct risk, in making vaginal examinations, of carrying up into the birth canal organisms which under favorable conditions may prove deleterious.

One can learn from a rectal examination all that is necessary to know in order properly to conduct a delivery in ninety per cent of the cases.

From the patient's view-point this method does not go contrary to nature's method of protecting the puerperal woman.

From the doctor's view-point it is attended with much less waste of time and trouble, and is therefore a procedure well worth the effort spent in acquiring confidence in it.

Melæna Neonatorum Treated by Injection of Fresh Citrated Blood.

LAPAGE, in the *Proceedings of the Royal Society of Medicine* for July, 1920, which has just appeared, states that the first case he had was that of an infant in the hospital. The infant was brought blanched, with a severe attack of melæna neonatorum, to the out-patient clinic. He said to his clinical clerks that he should have to give an injection of fresh blood or of fresh serum. One of them offered at once to supply the blood, and the resident surgical officer and house

surgeon drew off 20 Cc. of blood from his arm, mixing it with 7 gr. of sodium citrate, and they injected it into the external jugular vein of the infant. The next day the melæna had ceased entirely, and there was no recurrence. The infant was less blanched, and made an uninterrupted recovery. The coagulation time of the infant's blood was tested by a method which he had seen described in the *American Journal of Children's Diseases* for April, 1920, p. 269, and was found to be seventeen minutes approximately. Three weeks later it was found to be normal, about nine minutes. The coagulation time of the father and the mother was found to be normal.

The second case was that of a baby to whom he was called a few days later. This baby was exceptionally big, but he had had very severe melæna, his blood coagulation time was much delayed, and he was going downhill rapidly. The case was urgent, and it was late at night, so he had no time to select the donor by scientific methods, but he obtained the blood of a friend of the father, and injected 15 Cc. of citrated blood. In this case also the melæna ceased at once, and except for the passage of two more stools, which contained meconium mixed with blood, and which had probably been in the intestines from before the time of the injections, the child made an uninterrupted recovery. The coagulation time in the second case was over seventeen minutes at the time of the injection, and remained at seventeen minutes for some days, but about a week afterwards it had come down to approximately ten minutes.

With regard to the technique, the injection of fresh citrated blood into the jugular vein is by no means an easy operation, because the parts are so small, and it is his intention to use in the future the superior longitudinal sinus for such injections.

This method of treatment is not new. Koplik reports that he has made use of citrated blood and found it brilliantly effective, one transfusion being all that is necessary. He also says that horse serum

and gelatin are not nearly so satisfactory. Other authors give fresh serum subcutaneously in 10-Cc. doses. J. E. Welch recommends injections of normal serum subcutaneously, 10 Cc. three times a day. However Lapage is doubtful whether the serum injected subcutaneously is likely to prove as effective as intravenous injection of fresh blood from a suitable donor.

With regard to the question as to whether the blood of the mother can be used, it is quite possible, according to Koplik, that this will prove suitable, and in this case there is not likely to be any need for the classification of the donor and recipient, but of course this is not always a feasible plan.

The Toxicity of Alcoholic Liquids.

In an editorial on this subject, the *Lancet* of October 30, 1920, says the question of the effects of alcohol on the human organism is again approached in a recent report issued by the Medical Research Council, and in certain directions the results recorded in previous reports issued by the same authority are confirmed. The experiments described in this latest report include not only the examination of the effects of alcohol, but some other drugs during normal and fatigued conditions. For the moment, however, it confines itself to the findings in regard to alcohol. The tests were based on the precision with which dots could be inked on a traveling tape on which small circular areas were plotted out.

The authors are William McDougall, F.R.S., and May Smith, M.A., from the Psychological Laboratory, Oxford. They point out chiefly that a more extended investigation is necessary in the light of their interesting discovery that in the course of the protracted figure effects following several nights' loss of sleep, alcohol acts deleteriously during the stages of increasing inefficiency, whereas it acts beneficially as the subject later begins to regain his previous efficiency. At the former stage, for instance, it increases the errors, but at the latter it reduces them. The suggestion

is made, as an outcome of these investigations, that an important cause of the conflicting results of past workers may be due to the stage or degree of fatigue when alcohol was taken.

Blood Analyses Following Acacia-Glucose Injection.

WHITE and ERLANGER, in the *American Journal of Physiology* for November, 1920, state that a strongly hypertonic glucose and gum acacia solution was injected intravenously into normal, asphyxiated, and shocked dogs, and the resultant changes in blood volume and composition were studied.

The immediate effect was a marked increase in blood volume; in normal and asphyxiated animals the blood volume then gradually fell toward, but did not completely return to, normal in several hours.

The blood column, markedly diminished in shock, is increased to above its normal level by the injection and then gradually falls to or below its normal level.

The absolute plasma protein is increased slightly, or not at all, in normal animals and in asphyxiated animals; in an animal which had been bled there was a slight increase when the amount withdrawn was allowed for. The absolute amount of plasma protein is markedly diminished in shock, is increased by the injection, and the increase continues for some time after the injection. It is believed that at least a part of the increase in plasma protein following the injection in shock is due to a passage of protein through the vessel walls.

Gum acacia seems to take the place of plasma protein in holding water in the circulation.

There is a marked hyperglycemia immediately after the injection in normal animals; this is accentuated by morphine and asphyxia. The blood sugar value falls to or nearly to normal within two hours. In shocked animals the blood sugar behaves much as in normal animals. There is only a trace of sugar excreted by normal animals excepting when morphine or asphyxia causes marked glycosuria. Shocked ani-

mals without morphine excrete some sugar unless, as a result of the shock, there is a suppression of urine.

The fluid drawn into the blood stream brings with it chlorides in concentration equal to the chloride concentration of plasma, but the diffusion into the blood stream of sufficient additional chlorides to bring the chloride concentration of injected fluid up to that of plasma is not complete for several hours.

The entrance of urea into the plasma takes place with such facility that the non-

protein nitrogen concentration of the plasma remains constant.

There is no suppression of urine in normal animals as a result of the injection; if anything, the rate of secretion is slightly increased.

The crystalloid osmotic tension of the plasma does not remain constant.

No hemolysis, hematuria, hemoglobinuria, albuminuria, cylindruria, fluctuations in body temperature, or any other untoward effects were observed as a result of the injections.

Surgical and Genito-Urinary Therapeutics

Foot Abnormalities and Their Management.

MEBANE (*The Military Surgeon*, October, 1920) notes that for the practical management of these cases three questions required solution: (1) What should we consider as a normal foot? (2) What are the causes of foot trouble? (3) What is the most practical method of treating foot cases under army conditions?

In practice it was found that only two conditions need be met for a foot to be considered normal in the army sense—i.e., a foot on which a man can march and fight. The requirements are that there must be unrestricted motion of the foot joints, and that the line of weight-bearing must pass through the forefoot. Such considerations as height of arches are unimportant. Men accepted for the service on this basis had little foot trouble, and if trouble did develop it responded to treatment in the great majority of cases. On the other hand men accepted in violation of these requirements, such as cases of flaccid flatfeet with abduction and eversion, rigid or spastic flatfeet, rigid arthritic or post-traumatic feet, marked cavus, ankle valgus or varus following fracture, marked hallux valgus, hallux rigidus, and amputation or severe derangements of the joints of the great toe,

could only in a few instances be made fit for duty and in many cases were discharged from service.

Of the minor abnormalities, trauma due to wearing improper shoes played the greatest part. Abnormalities due to congenital causes or to trauma prior to entering the service were beyond control, and unless the disability was slight men with such disabilities were not accepted for full duty. With the men accepted for service it was found that much could be done to minimize the amount of foot trouble. Trouble resulting from trauma of improper shoes and overtaxing the feet could be prevented. Likewise much of the disability from infection could be controlled. The measures found useful in preventing foot trouble were proper shoes, correction of faulty attitudes of walking, use of "foot strengthening" exercises, prevention of overtaking, and elimination of infectious foci.

The shoe question for the soldier has been solved by the Munson shoe. This shoe possesses all the qualities desired for the average adult. The inner line is nearly straight. The heel is broad. The shank is stiff. The toe cap is wide. It gives the necessary support to the foot and at the same time allows development. Support for the adult foot, particularly in the early

stages of military training, is very desirable. This support is required on account of atrophy of the foot muscles which has resulted from the prolonged wearing of the short and narrow shoes of civilian life. The shoes must be properly fitted and at least a half-inch space must be allowed in front of the great toe. The degree of foot development that has resulted among soldiers from the use of properly fitted Munson shoes has proven a revelation to the surgeons.

The most frequently encountered faulty attitude of walking among soldiers is that of "toeing out." This attitude by throwing excessive weight on the weak inner border of the foot invites strain of the longitudinal arch. This danger is increased when heavy packs are carried. The remedy lies in teaching the importance of walking correctly, with the inner borders of the feet parallel. It has also been found that it is well to avoid excessive "toeing out" while standing. Strain can be prevented among those who are required to stand for long periods by frequent changes of attitude, standing with inner borders of the feet parallel, "toeing in," and turning over on the outer borders of the feet.

The use of four simple exercises has been found of great benefit in strengthening the foot muscles of soldiers in training. They must be given with the men wearing correctly fitting shoes so that the play necessary for muscle development may occur. The exercises require only a few minutes and can be given daily as part of the setting-up exercises. Each exercise is repeated about ten times. The exercises are:

Rising on the outer borders of the feet. In this exercise the men stand with their feet six inches apart and the inner borders parallel. The exercise is done on counts given by the officer or noncom in command. On the count 1 the men rise on the outer border of the feet, and on 2 they come back to their standing position.

Knee-twisting exercise. In this exercise the position of the feet is the same as in the above. The feet remain fixed and the motion is a twisting outward of the thighs

and knees, which elevates the arches. The movement is accomplished entirely by the external rotators of thigh. It is likewise performed to two counts. On 1 the knees and thighs are twisted out, and on 2 the men relax, allowing the knees to return to their original position.

Toe exercises. The position of the feet is the same. The exercise is done by first bending up or dorsiflexing the toes, bending down or plantar flexing the toes, separating the toes, and then coming to rest. It is done to 4 counts: 1 toes up; 2 toes down; 3 separate; 4 rest.

Rising on toes. The men standing with feet parallel and six inches apart rise up on their toes as far as possible, turning their heels out as they rise. They then descend gradually. They should not "flop down." This exercise is given in 2 counts: 1 up; 2 down.

Foot trouble from overtaxing the feet is likely to occur in changing occupations, from one requiring little use of the feet to one where much is required, as in the case of soldiers, or in starting to walk again after an illness or operation. Among soldiers it was found that trouble could be avoided by increasing the foot work gradually. By drilling new recruits on a plan that provided for frequent rests and changes of instruction no time was lost and little foot disability resulted. The use of "foot strengthening" exercises was also beneficial. On the first sign of trouble, strapping the arches and relieving the strain on the longitudinal arches by raising the inner border of the shoe was practiced. During convalescence following illness or operation it was found an excellent plan to strengthen the foot and leg muscles by massage and exercises before the patient began to walk. Walking was allowed only in high shoes. Too much emphasis cannot be laid on the dangers of slippers or loose hospital shoes. Such shoes give no support to the ligaments and muscles weakened by disease and non-use. Strapping and shoe alterations were made use of if there was any evidence of weakening of the longitudinal arch.

Infection operated in the causation of foot trouble in two ways. In some cases the organisms were actually present in the joints and soft tissues of the foot. The diagnosis in such cases was usually relatively simple. In the cases where the trouble resulted from focal infection the question was not always so simple. Many cases cleared up with the treatment of an old gonorrhea, the removal of diseased tonsils, or attention to the teeth. The possibility of focal infection should always be considered in treating foot cases.

The correction of foot deformities of recruits by operation has been almost entirely abandoned. The reason for this is that experience has shown that a strong marching foot cannot be obtained in a reasonable time by operative procedures. Much better results have been obtained by conservative measures. The use of adhesive plaster, felt and simple orthopedic alterations of the Munson shoe is sufficient to mechanically correct any case that is worth retaining in the service. The importance of strengthening weakened foot structures has not received the attention it deserves. The simple mechanical correction of a defect does not cure the condition. Stretched structures tend to regain their normal condition when relieved of strain by a correct appliance, but unless the muscles are strengthened so that they can stand the strain, removal of the appliance is followed by a recurrence of the original condition. We should aim in the treatment of static deformities of the foot to place the weight-bearing where it belongs by mechanical means and then educate the muscles to maintain it, so that mechanical aids can be dispensed with.

The use of some mechanical means to correct a static defect such as a weak longitudinal arch seems like a logical procedure, and in practice has been followed by good results. By such means weakened structures are relieved of abnormal strain, weight-bearing can be transferred to stronger parts, and the individual can be allowed about without danger of aggravating his condition. In civil life plates, felt

pads and shoe alterations have been used as mechanical means to accomplish this end. In military service plates are impractical; they are expensive; they splint the foot and thus prevent development of the muscles. They also create a sense of dependency that is difficult to overcome. Felt supporters placed in the shoes are open to the same objections, and when strapped on the feet are dirty and render satisfactory use of the foot exercises impossible. Orthopedic shoe alterations have been found the only practical method under army conditions.

For longitudinal arch trouble, simple inside leather wedges have been found entirely satisfactory. The wedges are inserted between the layers of sole and heel of the Munson shoe. The thickness of the wedges varies from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch, depending on the case. Extending the heel or reinforcement of the shank of the Munson shoe was found unnecessary. It is believed that failure to obtain results from shoe alterations has been due to the use of improper shoes, failure to adapt the height of the wedge to individual requirements, failure to properly carry out treatment, or to improperly made alterations. In reference to the last attention is particularly called to alterations nailed on the outside of the shoe. Such alterations, in addition to being unsightly, wear down rapidly and a uniform correction is not maintained.

For affections of the anterior arch the anterior wedge has been used. The wedge has been inserted between the layers of the sole in such a position as to transfer the weight-bearing from the heads to the shafts of the metatarsal bones. For successful results it has been found necessary to determine the proper position of the wedge by inserting it with the patient present and altering the location until relief of the symptoms has been obtained. A modification of the anterior wedge has been made use of in cavus cases. A broader wedge, placed further back, has been used, similarly inserted, so that weight-bearing was evenly distributed along the outer border of the

foot. Cases of short heel tendon were treated by raising the heel of the shoe.

Measures to strengthen the weakened foot structures were commenced as soon as shoe alterations had been made. Graduated foot exercises were the most important means of accomplishing this end, but massage and contrast baths were made use of when possible. The foot exercises were ordered for cases of poor development of the foot muscles, subacute and chronic flat feet, ankle valgus, cavus, and the affections of the anterior arch. In acute foot strain they were not used until the acute symptoms had subsided. For the treatment of rigid or spastic flat feet preliminary treatment is required to convert the condition into a simple flatfoot.

The Conquest of Venereal Infection.

ROUT (*New York Medical Journal*, Oct. 9, 1920) under this encouraging title states that in the army venereal disease has been conquered. Wherever prophylaxis was properly applied, at least two-thirds of the cases of venereal disease were eliminated. This is the official statement of the American army, and it coincides with that of the Canadian and Australian armies, on broad lines.

The author notes that in August and September, 1917, over five thousand British troops came to Paris on leave without prophylactic measures being provided, and 1038 became infected, over twenty per cent. Leave was then closed down. Three prophylactic stations were established and prophylactic tubes were issued, with the result that within the next six months some twenty-five thousand to thirty thousand troops came on leave to Paris, the amount of venereal infection among them being reduced to less than 3 per cent.

Among the Anzacs in five months there were only 20 venereal infections recorded at the Medical Report Center, whereas many hundreds of infections were recorded against other troops.

In November and December, a period of five weeks, when the supplies of prophylac-

tic outfits ran out, there were 24 infections, four more than during the previous five months. The most striking return was one furnished for the twenty-two days ending October 17, 1918, because a special medical effort was made to protect the Anzac troops during September-October, the result being as follows: Venereal infections recorded at Medical Report Center, Paris, for twenty-two days ending October 17, 1918: no New Zealanders, no Australians, thirty-three Canadians, and twenty-four English; and a further return for the six weeks ending October 31, 1918, gave only three infections among the Anzac troops and forty-two among the English. As the New Zealanders and Australians were the only troops given an unlimited supply of prophylactic outfits, the conclusion is obvious. When men and women are properly instructed in the method of preventing infection and are supplied with proper medications, venereal disease can be practically extirpated except among the drunken, and experience shows quite clearly that the vast majority of those who risk infection are not in a state of alcoholism when they do so.

Further the providing of this means does not act as an incentive to immorality; rather it is a continual reminder of the dangers likely to be incurred by loose and irregular relationship.

The microbes of venereal disease grow almost exclusively in the genital passages of men and women. If these passages are kept clean and disinfected, the microbes will not grow. Venereal disease does not always spring from immorality, or even from sex-relationship, but from contact with infective matter. Using some sort of grease beforehand prevents direct contact; the microbes will not pass through a film of oil. They will not adhere to a greasy surface, hence are easily washed off with soap and water after contact, and soap is destructive of the microbes both of syphilis and gonorrhea. It is seldom that a person who has used vaselin beforehand and soap and water afterward becomes infected; if so, that merely proves that the precautions were carelessly carried out. Urinating im-

mediately after contact is also a protection. Bathing with cold water is also protective. There is no excuse for doing nothing, and little excuse for delay; but if there has been delay, skilled treatment should be sought as soon as possible. The kind of precaution necessary to insure protection is dependent on the kind of risk run. Only the persons themselves know the nature of the contact, the length of time occupied, the number of repetitions, and so forth. Contact with infective matter for a few moments is one thing; contact with infective matter for a whole night, quite another. But every irregular contact is a risk; avoid risks, or disinfect immediately.

As a result of war and after-war conditions, venereal disease has greatly increased in all the Allied and enemy countries; probably no European country has less than three or four times the amount of disease it had in 1913-14. Once in the lifetime of every generation all mankind must pass through the bodies of its women. Shall we make and keep those bodies clean? Knowledge has given us power, and with this new power we shall be able to rid our nation of the most dreadful of all human scourges. Victory is within sight. When it comes sex will regain its loveliness.

Radium Treatment of X-Ray Burns.

QUIGLEY (*Urologic and Cutaneous Review*, October, 1920) suggests this novel and original form of treatment on the basis of clinical experience. He states that the good effect of radium treatment is apparent not only in the old chronic case but also in acute x -ray burns, and if used in the acute stage a smaller dose will suffice and less tissue will be destroyed. Some of the cases treated by the author have been so extensive that there was no hope of the skin filling in the defect, and in these cases skin-grafting was done, always with a successful result. These same cases had been repeatedly skin-grafted before the use of radium without success.

It is a notable fact that in every case treated many different methods of treat-

ment had been tried before resorting to radium—curettage, skin-grafting, skin-sliding, washes, salves, ointments, violet rays, etc.; but in no case were these things of the slightest benefit to the patient. On the other hand these ill-advised measures increased the days of suffering and invalidism and contributed to the destruction of tissue and often the mutilation of precious anatomical structures.

It would seem that with the excellent results to be obtained with radium in these cases and the entire lack of favorable results with other methods of treatment, the patient should be advised to seek radium element as soon as it is known that he has been administered an overdose of x -ray.

The physiological effect of radium rays on tissues is entirely different from that of the x -ray.

The x -ray causes chronic ulcers that do not heal and lead to the development of cancer. Radium burns always heal quickly and easily unless there is some constitutional disturbance such as diabetes or nephritis, and there is no tendency to cancer formation.

The rays of x -ray are irritating and poisonous, the rays of radium are benign and healing. In several thousand radium applications covering a period of seven years the author has burned every patient to whom he has applied radium. In using x -ray he would not knowingly burn any patient.

A New Principle in Surgery of the Large Intestine.

Under this somewhat startling title DR. FRITZ PENDL (*Archiv f. Klin. Chirurgie*, Sept. 20, 1920) announces a new thought and one of great value; to wit, the free use of castor oil before and immediately after operation on the large intestine and rectum. This will give better results than have been obtained by the method, which he believes has been universal, of postoperatively locking the bowels for some days. He observes that circular suture will hold, or if it leaks this leakage will not occur

until the period when granulations have offered an adequate protection against any serious danger. He advises that the anus be kept open by a glass tube of proper shape which may be left in place for many days.

Tetanus and its Antitoxin.

JOSEPH MCFARLAND in a leading article in the *Pennsylvania Medical Journal* for November, 1920, observes that following the introduction of the antitoxin treatment of diphtheria by Behring, in 1890, about a decade was required to convince the medical profession of its prophylactic and therapeutic value, and another decade had to pass before statistical computations based upon millions of cases could be made convincing as to its value.

When Park, in 1912, published his tabulation of cases from eighteen of the world's largest cities, there was no other possible explanation of the diminution of the death-rate from 66 per 100,000 among 16,526,135 population in 1890, to 19 per 100,000 among 22,790,000 in 1905, than that it resulted from the increasing use of the antitoxin, and a better acquaintance with the methods of administering it.

The statistical studies of diphtheria, with regard to the value of antitoxin in its treatment, were however comparatively simple when contrasted with similar studies upon tetanus and its antitoxin.

Tetanus antitoxin, first made by Behring and Kitasato, in the same year (1890) as the diphtheria antitoxin, and more and more hopefully received and employed as the benefits derived from the diphtheria antitoxin were made more and more clear, failed to give the same conclusive evidence of usefulness.

There were many explanations of this. In the first place, diphtheria is a common disease, tetanus a rare one. Diphtheria is a readily transmissible, highly contagious disease, and tetanus scarcely at all so. The former was therefore early made the subject of strict registration, the latter only much later made reportable. For long it

was quite enough to report it when the patient was dead. Statistics could be easily computed from the entire number of cases occurring in diphtheria, while only from the number dying in tetanus. Only in hospitals, where both the number of cases and number of deaths were known, could the two be satisfactorily compared, and in any of them the total number of cases was too small.

Such was the state of affairs with regard to tetanus when Moschowitz published his review of the subject in 1900. He had to cull out of the literature of medicine the cases reported to have been treated with antitoxin, and those reported as not having been so treated, and then make his comparisons. This was both difficult and, as regards error, dangerous. Many whose patients recovered from tetanus without the antitoxin hastened to report the fact, while others, whose patients died in spite of it, suppressed the information, fearing that the publication, appearing before the failure could be properly explained, might be productive of harmful results.

However, comparing the two groups of cases as well as he was able, Moschowitz came to the conclusion that under the antitoxin treatment, the death-rate from tetanus had been reduced from 80 per cent, at which it stood in the non-antitoxin cases, to 40 per cent in the antitoxin-treated cases.

Most subsequent writers, though few have found so high a percentage of benefit as Moschowitz, find a decided diminution in the death-rate in favor of the antitoxin-treated cases.

Their difficulties were much the same as those of Moschowitz. All of the cases of the disease had not been reported; those reported had not been similarly treated; those that had been treated had received very different doses and methods of administration, so as not to be easily comparable—there was no satisfactory standard of comparison.

It is therefore with much interest and satisfaction that the author has read the "Analysis of 1458 cases of tetanus that occurred in home military hospitals, during the years 1914-1918," published by Sir

David Bruce in the *Journal of Hygiene*, July, 1920, vol. xix, No. 1.

The number of wounded soldiers sent from the western front between August, 1914, and November, 1918, was 1,242,000. The number of tetanus cases among them was 1458, and the statistical study of them is the substance of the paper, the facts being displayed in many charts and tables.

The first thing to strike the reader is the overwhelming disproportion of cases that occurred in the months of September and October of 1914.

In August of that year there were 3 per 1000; in September, 9 per 1000; in October, 7.5 per 1000; and then, though the war goes on as usual, and multitudes of men are wounded, the incidence of the disease declines to about 3 per 1000, above which figure it never again rises. This is to be explained by the fact that at the very beginning of the war the importance of tetanus was not yet recognized, and no satisfactory means was at hand either to prevent its occurrence or to combat it where it already existed.

In answering the question, "Why this continuous and progressive diminution leading towards the final extinction of tetanus as a complication of wounds took place?" Bruce answers as follows: "Unfortunately the causes are mixed, and two separate measures were introduced for the prevention of the occurrence of tetanus." Of these he speaks as follows:

"The surgeon's knife, after all is said and done, is the best means of preventing the occurrence of tetanus after the wound has been inflicted. Dead putrefying tissue is the best culture medium for the anaerobe. At the beginning of the war the treatment of wounds was not thorough at the primary operation. It was thought sufficient to wash out the wound and apply an antiseptic. Controversy was acute in regard to the merits of chlorine, common salt, bipp, flavine, etc. It was only when surgical teams were boldly pushed to the front, and thorough excision of the damaged tissues in the wounds carried out, with primary or secondary delayed suture, that any real

advance was made in the treatment. Any one who saw these wounds in the base hospitals in France a few days after they had been inflicted must have been struck by the extraordinary results. One could almost foresee the time when the antitetanic serum would no longer be required.

"Some two months after the beginning of the war it was ordered that every wounded man should receive an injection of 500 units of antitetanic serum as soon after he was wounded as possible. This had a most important influence on the incidence of tetanus among the wounded men. . . The ratio of the number of cases of tetanus to the number of wounded was several times as high in September and October as in November and December. In September it was 9 per 1000, in December it fell to 1.4 per 1000. Now this fall was undoubtedly due to the fact that few prophylactic inoculations of antitetanic serum were made until the middle of October. It appears that only a small quantity of the serum was taken out with the expeditionary force in August, 1914, and this only for the purpose of treatment. It was not until the number of cases of tetanus became alarming that steps were taken to secure a large supply and insure that every wounded man received a prophylactic dose. It was not until about the middle of October that prophylactic inoculation was introduced on anything like an adequate scale, and it was at this time that the remarkable fall in the incidence of the disease took place."

In regard to the prophylactic employment of the serum, Bruce comes to the following conclusions: "At the beginning of the war one prophylactic inoculation was the rule, but in June, 1917, it was ordered that four should be given at intervals of seven days, each injection to consist of 500 units." Col. Lingard, of Queen Mary's Military Hospital, Walley, gives some interesting details bearing upon this question. He states that since the order was issued on the 17th of June, 1917, and had time to be introduced and carried into effect, 15,152 surgical patients of the British expeditionary force have been admitted to his hospital,

without a single case of tetanus developing. He considers this a most encouraging and satisfactory result, and that it justifies all the extra expense and labor involved in the multiple inoculations.

The prophylactic inoculations increase the duration of the incubation period. "With one inoculation the average incubation is 38.2 days; with two, 33.6 days; with three, 51 days; and with four or more, 83.7 days.

"Wounded men who received one inoculation had a case mortality of 25.1 per cent; those who received two, 21.3 per cent; three, 16.5 per cent; and four or more, 7.1 per cent."

The best dose for prophylactic purposes is placed at 500 units.

In regard to the therapeutic value of the antitetanic serum, Bruce has much to say:

"The only specific therapeutic treatment is by the injection of tetanus antitoxin. It has been proved up to the hilt that the prophylactic inoculation of antitoxin is of very great value; lowering the incidence, lengthening the period of incubation, and lessening the death-rate. But when an attempt is made to appraise the value of antitoxin, given after the symptoms of tetanus have declared themselves, great difficulty is met with. Wide differences of opinion are held, many holding that if given early and in sufficient quantity it acts powerfully for good; others doubting its usefulness but hesitating to discard it altogether. The latter argue that as it is the only rational specific drug against tetanus in our possession it would be wrong to withhold it in such a fatal disease as tetanus. They think there is an off chance that it may turn the scale in favor of the wounded man.

"In regard to the statistical proof of the value of antitoxin as a curative agent it is very doubtful if any truth can be arrived at by the study of the figures at our disposal. There is no uniformity in the treatment of tetanus in man. The men who suffer are also, as a rule, suffering from other grievous maladies—wounds, fractures, septicemias, pneumonias, hemorrhages, heart failures, etc., so that if a man dies it is impossible in many cases properly

to fix the blame. Captain Golla, a member of the tetanus committee, has compared the results obtained from the use of therapeutic serum in this war with those of preserum days. He is of the opinion that the rate of mortality in cases of tetanus in this war which did not receive a prophylactic injection of antitoxin, but did receive therapeutic treatment, approaches very closely to the rate of mortality in preserum days. In other words, it would appear from his figures that the therapeutic use of serum is of little or no practical value in treatment. It is taught at the present time that tetanus toxin that has been taken up and fixed by the nerves or nerve cells is inaccessible to antitoxin. If a lethal dose has been taken up by the nerves and is traveling toward the nervous centers, before the serum treatment is begun, then no amount of antitoxin will save the patient.

"But in spite of these statistical considerations, and in view of the experimental results, it is clear that medical officers will continue, for the present, to give a case of tetanus the benefit of the doubt and use antitetanus serum therapeutically. As Ransom states, it may neutralize some of the free toxin in the blood and lymph, and prevent it ultimately entering the nervous system and causing death, when the toxin already admitted through the motor nerves is not sufficient to do so."

In regard to the best method of administration, Bruce falls back upon the experiments of Professor Sherrington, in stating that the intrathecal mode of injection is the best. Sherrington experimented upon 130 animals. Of these there were no recoveries when the injection was made intradurally into the cerebral tissues. Two recovered when the injection was made subcutaneously; 14 out of 25 recovered when the injection was made into the lumbar region of the spinal cord.

"One therefore would conclude that a dose of 20 Cc. of high potency serum, containing 16,000 units, given intrathecally in the first and second days, supplemented and continued by intramuscular and subcutaneous injections, would be sufficient to

keep the fluids of the body amply supplied with antitoxin.

"In England alone, during this war, it is probable that some two millions of prophylactic doses of antitetanic serum have been given. Out of this huge number only 11 cases of anaphylactic shock have been reported. All 11 cases recovered. No doubt these cases appear very alarming when they occur, but they are so rare that they may be looked upon as negligible.

"Two per cent of the cases of shock followed the intrathecal injections, 6 per cent the intravenous, 1.2 per cent the intramuscular, and 0.2 per cent the subcutaneous route of injection. It is evident from these figures that the most dangerous route for the therapeutic injection of antitetanic serum is the intravenous.

"Anaphylactic shock is by no means a rare phenomenon after therapeutic injections of antitetanic serum, and markedly reduces the questionable usefulness of therapeutic serum."

Treatment of Vascular Nevi with Radium.

MONTGOMERY and CULVER (*Boston Medical and Surgical Journal*, Sept. 30, 1920) observe that the influence of radium is most marked on large tuberous nevi; in which the growth, if it is progressive, is not alone stopped, but the tumor also shrinks in size, and the startling red color disappears. They call attention to the fact of the importance of the proper application.

Usually included among the vascular nevi, but not at all in the same pathological class, is the spider nevus. It consists of a bright-red, central point, with dilated capillaries radiating out from it. This is not at all amenable to radium treatment as it does not contain any nevus tissue or hyperplastic nevus blood-vessels to be acted upon by the gamma rays.

The dilated central point and the radiating capillaries are easily obliterated with the electrolytic needle.

The Effects of Inbreeding and Consanguineous Marriages.

It is noted in a leading article in the *British Medical Journal* of October 2, 1920, that the popular impression that inbreeding in animals and consanguineous marriages in man are bad for the race, probably depends to some extent on the opinion expressed in 1878 by Charles Darwin that "the consequences of close interbreeding carried on too long a time are, as is generally believed, loss of size, constitutional vigor and fertility, sometimes accompanied by a tendency to malformation." The matter, indeed, was regarded as so definitely settled that no experimental work was done for many years, and it is only within the last decade and a half that the problem has been again attacked.

Among the researches bearing on this question, that carried on for more than nine years by Dr. Helen Dean Kin, Assistant Professor of Embryology at the Wistar Institute of Anatomy and Biology, Philadelphia, deserves special attention on account of the minute care and attention to detail displayed, especially as regards hygienic and dietetic conditions. Albino rats were employed, and the experiments began in 1909 with two females that were mated twice with a brother from the same litter, and then twice with an unrelated male stock; for twenty-eight generations this programme was continued, all the females used being from inbred litters. In the earlier generations the inbred rats showed all the defects popularly supposed to appear in any closely inbred stock; thus many females were sterile, the litters were small, many of the rats were dwarfed and short-lived, and malformations, especially of the teeth, were common.

If the experiments had been stopped at this point the results would have confirmed the conclusion reached by Darwin and others, that inbreeding invariably leads to sterility and physical degeneration. Fortunately, however, many rats in the general stock colony, in which there was no inbreeding, showed the same features, and

it was found that the diet was at fault. After correcting the adverse factor in 1911 all the characteristics said to be typical of the dire effects of inbreeding were banished, and have never reappeared. These results confirm the conclusions of Gentry on swine and of various stock-breeders on horses and cattle (Chapeaurouge, Anderson) that there is not any general physiological law forbidding inbreeding, and that the results obtained depend largely on the character of the stock that is inbred.

Reduction of Old Dislocations of the Hip by Open Incision.

BUCHANAN (*Surgery, Gynecology and Obstetrics*, November, 1920) holds that analysis of these cases will show that, while open reduction in old hip luxations is usually difficult and not altogether devoid of danger, it is the operation of choice. In a large proportion of cases it greatly improves the use of the limb, and in very many restores its complete function. Where reduction is impossible, resection of the head may still be done to secure improved position of the limb. This operation, however, has a higher mortality and is followed by less perfect use.

If assorted into decades, it will be found that three open reductions were made in the eighties, 21 in the nineties, 20 in the first decade of the present century, and only six reported in the last ten years. The reason for the small number of cases reported in recent years is probably incident to the general use of the x-ray, which has rendered this diagnosis easy even to those not skilled in surgery.

In four cases the trochanter was chiseled through at the base, and after reduction had been accomplished, fixed back into place, once with screws and three times with silver wire. In 11 cases all muscular attachments were separated from the great trochanter, usually subperiosteally. In 30 cases, it was noted, the acetabulum was emptied of its connective-tissue filling with scissors, knife, or curette. In one case it was said to be empty. In one case the

acetabulum content was not removed, and in its recurrence of the dislocation took place. Tenotomy of the adductors was resorted to in one case, and the chiseling of the rim of the acetabulum in another.

Of the 45 cases reported, 36 (80 per cent) had good results and 9 (20 per cent) had moderate improvement or poor results.

Buchanan reports a case of luxuation six months old. The acetabulum was freed through dissection. The limb was fixed in abduction to a long splint with slight traction.

Foot-drop followed the operation, but it finally disappeared. Eleven months after operation the patient exhibited a shortening of something slightly over an inch with abduction of 25 degrees and flexion of the hip of 35 degrees. He walked with a solid gait and without pain and was working as an automobile repairman.

The Causation of Appendicitis.

SHORT (*British Journal of Surgery*, October, 1920) contributes a somewhat exhaustive study on this subject bearing on the alleged increase of the affection, which he holds well corroborated by hospital and mortality statistics. He states that there is some evidence to show that the poorer classes, at any rate those living in institutions, show a relative immunity.

Thus he quotes a public school with 500 boys between eight and eighteen who were liberally fed, in which there were 19 cases of appendicitis. There have been four cases of appendicitis in the past five years in a children's home with an average of 950 inmates over eight; the diet consisting of bread with margarine, treacle, or dripping, and porridge daily with milk, together with tinned meat, potatoes, cabbage on certain days, and fresh meat with vegetables once a week. This shows a much lower incidence.

The author takes up the subject of the national distribution of appendicitis and of appendicitis in animals. He holds that the disease was present, but relatively rare, in this and other countries at the end of the

nineteenth century. Since then it has become very common in most civilized countries. The rise was more marked at first in towns and in the male sex, and probably in the better-off classes. The privations of war did not reduce it. The national distribution is very unequal.

In Asiatics, Africans and Polynesians it is rare, unless they take to European food. The disease appears not to occur in animals in the wild state, but it is quite common amongst animals in captivity; this especially applies to apes.

The most probable explanation as to the rise and incidence of appendicitis is some change in the food habits of the people. Wheat, flour, and grain, butter, tea, and coffee are all exonerated, as causative factors, as is sugar. Chocolate is looked upon with some doubt. Meat has been arraigned as a dominant cause. The author, after a careful study of the proof against it, holds that it must be held guiltless. As to the ultimate cause of appendicitis the author states that his tables have clearly demonstrated that during the past thirty years, and especially between 1890 and 1905, the dietary of England underwent a radical change by the importation of greatly increased quantities, not of one foodstuff, but of many. Preserved meats, butter, tea, cocoa and chocolate, rice and bananas, have all gone up. The importation of wheat rose immensely at the same time—60 million cwt. in 1890 and 97 million cwt. in 1905. Potatoes rose from about 2 million cwt. in 1890 to 3½ million cwt. in 1905. What does all this mean? It means, infallibly, that older home-grown foodstuffs have been more or less crowded out by the newer, more tasty, or more nourishing imported articles. Turnips, carrots, parsnips, leeks, asparagus, cabbage of various sorts, rhubarb, lettuce, celery, the coarser fruits and vegetables, oatmeal porridge, rye, barley, or other flours—in a word, the cellulose-containing foods—have been replaced in the dietary. It is not necessary to prove that the average Britisher eats less, absolutely, of any or all of these than did his forefathers. That is probably true—

the author thinks there has been a marked falling off in the consumption of cellulose—but it would be difficult to prove. The point is that, relative to the total food eaten, cellulose consumption has fallen, and this has been mathematically demonstrated by the figures given, showing a rise in the personal use of meat, rice, cocoa, chocolate, sugar, and the rest. The consumption of wheaten flour in bread, and especially in cakes and pastry, has also risen, so has that of potatoes. Modern white bread contains less cellulose than the older browner breads. If a man took porridge for breakfast; soup, turnips, cabbage, and potatoes for dinner; and brown bread and butter and lettuce for tea in 1890, the bulk of cellulose in his total food has been reduced if he now adds bacon, Australian meat, and cakes to his meals, even if he does not drop out the porridge, greens, brown bread, and lettuce.

Let us see how this theory will fit out facts.

The time criterion is correct. It was between 1895 and 1905 that the great dilution occurred, and then appendicitis had its increase. Since then the dilution and the increase have both been much less marked.

The cellulose foods would be in favor longer in the country than the town, but nowadays country diet and town diet are much alike. The appendicitis rise began in the town.

In institutions, the older, simpler, and cheaper foods are still used, and are less diluted.

Apes in captivity do not get the coarse fibrous foods they did in the wild state.

During the later stages of the war, in spite of various privations, there was no great return to the old coarse foods. People ate less, but of the foods they were accustomed to. Soldiers got "pork and beans," Maconachie ration, and often fresh vegetables to protect them.

The national distribution of appendicitis is much in favor of the theory. Almost every report from countries where the disease is seldom seen amongst natives lays emphasis on the fact that they partake of

vegetables and other cellulose-containing foods. When individuals take up European habits, they drop their coarser articles of diet.

There is some direct experimental evidence on the subject. Von Knierien showed in 1885 that rabbits fed on a cellulose-free diet develop inflammation of the intestines, and especially of the cecum, which may be fatal. This does not occur in carnivora, whose cecum is usually small. Apparently the effect is mechanical, because horn-shavings suffice to avert the trouble. Cellulose, of course, is mainly unaffected by the digestive processes.

It is of course possible that some "vitamines," so-called, may be bound up with the cellulose. McCarrison showed that autoclaving their food produced in monkeys marked distention and congestion of the intestines, colitis, loss of lymphoid tissue, and invasion of the mucosa by bacteria.

At a large public school in Bristol, there has been noticed over a great number of years a remarkable seasonal association of one or two cases of appendicitis with epidemics of feverish colds and attacks of pharyngitis or tonsillitis popularly called "influenza," but probably not the same as true pandemic influenza. Krogus comments on the same association in Helsingfors. True pandemic influenza does not seem to act in the same way.

Concretions are formed *in situ*, from a mixture into which dried feces, calcareous secretions from the mucosa, and possibly, as Williams suggested, unabsorbed fat residues, all may enter. Probably the presence of a true concretion (not of a nodule of feces) proves that the mucosa is not normal. Concretions play an important part in determining an acute attack. There is often a very characteristic history of pain without fever for a day or two, due to appendicular colic, then fever from inflammation of the mucosa distal to the obstruction, owing to lack of drainage, then a day later, or less, sudden cessation of pain from perforation, followed by the signs of localized peritonitis.

Malignant Disease in the Lip and Jaw.

COLE (*Lancet*, Oct. 23, 1920) devotes his attention to a consideration of the means by which the disease may be eradicated, function restored, and deformity avoided. He quotes Broders' division of epithelioma of the lip into four grades, according to the differentiation of the cells. The least malignant type is that in which differentiation is most pronounced, whereas lack of differentiation indicates quick growth and more pronounced malignancy. The microscopical appearance is of little value as an indication for treatment, but may be of considerable value from the point of view of prognosis.

The relative rarity of the disease in females is an outstanding feature. In Broders' series of 537 cases the male patients numbered 526, whereas only 11 were females, a proportion of 49 to 1. C. Rowntree recorded particulars of 241 cases, males affected being 233 and females 8, a proportion of 29 to 1. In the Cancer Hospital malignant disease of the tongue in women is sufficiently uncommon. Malignant disease of the lip is even more so.

A large proportion of people affected are connected with outdoor activities, Broders noting that 68 per cent were thus employed. In a number of cases, too, the malignant lesion is preceded by a sore or ulcer. The freedom of the upper lip as compared with the lower is very striking; the lower lip is affected in 96 per cent of the cases, the remaining 4 per cent being those in which the upper lip and the angles of the mouth are the sites involved.

The lesion is usually situated to one side or other of the middle line, and shows a marked predilection for the muco-cutaneous surface. In those cases affecting the free border of the lip the influence of syphilis would appear to be a negligible factor. This is in marked contrast to the findings in malignant disease of the tongue, where a definite history of syphilis can be elicited in something like 95 per cent of the cases.

The question of differential diagnosis is not difficult, for the only lesion from which

epithelioma must be differentiated, apart from simple ulcers, is a primary chancre. The condition of the glands will readily serve to distinguish the one from the other lesion.

In the case of war wounds plastic surgery of the lip, as of all other facial defects arising similarly, is the plastic surgery of residual deformities. In other words, the responsible wounds have necessarily been allowed to cicatrize before any operative procedure to remedy the defect can be undertaken. This limitation is a matter most emphatically not of choice but of necessity. In the process of healing scar tissue is formed radiating to a variable extent according to the conformity and severity of the wound into the surrounding tissues, thereby diminishing their nutrition and leading to a loss in them of elasticity and plasticity which are their normal attributes.

The Knife Cautery in Surgery of the Thorax.

VAN PAING (*New York Medical Journal*, Oct. 30, 1920) lauds the knife cautery as a means of decreasing postoperative shock, hemorrhage, and the morbidity incident to convalescence. It can be used in incising the visceral pleura and the lung proper, in removing foreign bodies, such as bullets, fragments of high explosive shells, and particles of bone or bits of clothing carried into the lung tissue by the missile, and in operating for hemorrhage, lung abscess, or tumor. Before the advent of the knife cautery, pulmonary operations were the least developed and the least understood, from the view-point of technique and postoperative complications of all forms of surgery. The mortality rate was exceedingly high, shock and hemorrhage being the chief contributors, and the postoperative morbidity continued over a period of weeks or months.

Heretofore hemorrhage has been very difficult to control and postoperative oozing has caused a large number of deaths, owing

to the facts that suture of lung tissue is unsatisfactory in the control of bleeding and the needle punctures themselves continue to bleed after the wound is closed. Lung tissue in particular must be free from oozing when the wound is closed, or the bleeding may continue for an indefinite period, exsanguinating the patient and being almost impossible to control without a large firm packing. The removal of this packing produces a return of bleeding, and while it is in position it causes incessant coughing, which so greatly weakens an already overburdened heart that cardiac dilatation is likely to occur. Furthermore, iodoform or cyanide gauze will in almost every case cause some symptoms of toxemia, the absorption being so rapid that often within twenty-four hours toxic symptoms manifest themselves by rigor, vomiting, high temperatures, and delirium.

The location of the primary incision on the chest wall should conform to the pulmonary area to be incised as nearly as possible. Preliminary outlining with iodine or silver nitrate stick is useful in that it remains as a guide after sterilization of the chest wall is complete. The incision may be U-shaped or longitudinal, conforming to the contour of the ribs, the primary flap consisting of skin, superficial and deep fascia down to the muscle. The muscles may be separated or incised. The number of ribs chosen is important, three being the usual number. All of them may be fractured, and reflected; or one may be fractured and removed and the one above and below displaced widely with a rib spreader or a Balfour abdominal retractor, which answers the same purpose. At this point the author makes a practice of tying all bleeding points and removing all forceps.

The parietal pleura is grasped with stomach forceps and the knife cautery at red heat is applied in a line about three inches in length and enlarged if necessary to admit of free access to the underlying structures. This incision in most instances should conform to the direction of the ribs. Four stomach forceps are applied to this

parietal incision, and it is retracted well above and below, and stitched to the visceral pleura with single 0 continuous catgut on a full curved fine needle.

The knife cautery at red heat is applied to the visceral layer, the length corresponding to the parietal incision. The anesthetic is removed as the lung is approached, and the cautery is used as one would use a scalpel in penetrating the lung tissue. With this method hemorrhage is practically absent except in the division of the larger blood-vessels, and for the sake of safety these should be tied.

The foreign body having been removed, or the abscess drained, as the case may be, the line of incision is permitted to collapse after the insertion of a fan-shaped drain of rubber tissue or a small cigarette drain, loosely covered and without gauze projecting from the end. If the wound edges are not apposed at the completion of the operation, one kidney suture of fine catgut may be used on a heated needle. The wound in the pleura may be partially closed over the drainage and buttonhole incision made through the skin. The rib retractor is removed and the fractured rib replaced; or removed entirely, in the pus cases. The skin is closed with interrupted silk or silk-worm-gut and adhesive tape tightly applied, the wound is dressed, and a pneumonia jacket applied.

Traumatic Fat Necrosis of the Female Breast and its Differentiation from Carcinoma.

LEE and ADAIR (*Cornell University Medical Bulletin*, Volume X, No. 1) report two cases of fat necrosis of the breast. Clinically the simulation to carcinoma is very startling. In one case the amputation of the breast, muscles and axillary contents was performed, the operator believing that the tumor was malignant. In the other only local removal of the mass was practiced; a gross examination of the cross-section, in the operating-room, led to the belief that the induration was carcinomatous and

the breast was removed, but the muscles were not sacrificed. The first patient received a definite trauma to the right breast. This was not followed by either tenderness or pain. Three months later a lump appeared about the size of a lime at the site of the former injury in the upper outer quadrant, slightly adherent to the skin, with some surface dimpling. Microscopic examination showed broad areas of fat necrosis.

The second patient had received hypodermoclysis of the right breast. One month later she accidentally noticed a small lump, about the size of a walnut, in the upper and inner part of the right breast at the site of the previous injection. This lump steadily increased in size. There was slight skin adherence.

At the Memorial Hospital the ratio of traumatic fat necrosis of the breast to mammary carcinoma is as 2 to 330, or 0.6 per cent.

Ewing reported that from the naked-eye appearance the growth could have been distinguished from carcinoma.

From these cases the authors conclude that traumatic fat necrosis of the female breast is a definite clinical entity. It must always be included with the benign lesions of the breast. Clinically it resembles carcinoma of the breast more closely than does any other tumor, and must be differentiated from it. A distinct history of trauma to the breast and a well-circumscribed, firm mass, showing rapid increase in size, unassociated with pain and without axillary nodes that are firm, suggest the possibility of fat necrosis. Local removal of such a mass is justifiable if a proper gross diagnosis can be made in the operating-room. Should the gross examination reveal carcinoma, complete amputation may then be performed. The diagnosis of traumatic fat necrosis of the breast by gross examination is possible. The gross features of this lesion should, therefore, be clearly understood by every surgeon. Further research, along chemical as well as along morphological lines, may throw additional light upon the real nature of this process.

Reviews

A TEXT-BOOK OF PATHOLOGY. By Dr. W. G. MacCallum. Second edition, thoroughly revised. W. B. Saunders Company, Philadelphia, 1920.

This remarkably well written and interesting text-book by Dr. MacCallum has now reached its second edition. It is quite freely illustrated, and is characterized from the standpoint of the author by clearness of diction and by the development of his text in a manner which makes it easy to read. The publisher has done his part by supplying good spacing between the lines, with a handsome paper, and this has enabled him to make the illustrations clearer and better than in many other works. The volume contains no less than 1155 pages, and space is saved from time to time by the use of small type when comparatively unimportant matter is being considered. A bibliography, having particular bearing upon the subject under discussion, is attached to each chapter.

As the author well says in the preface to the second edition, the four years which have passed since the book was first published have witnessed most of the unheard-of physical and mental insults brought by the war to human beings, most of the great epidemics, and all the misery and disease that have followed famine and cold. For this reason investigators have concentrated their attention upon the study of the infectious diseases, including those caused by animal parasites, upon wounds and the effects of poisonous gases, and upon the results of malnutrition, to the exclusion of all those diseases which we have constantly with us in times of peace. The result of this has been an immense addition to our knowledge along these lines. Many new illustrations have been added and some which did not seem particularly useful discarded.

The author endeavors from first to last to discuss disease as far as possible upon the basis of etiology, but he has dwelt only

lightly upon the subject of resistance and immunity because these fields are now so large that they deserve special works of their own.

In reading the text of Dr. MacCallum's book, one is impressed with the fact that it is not a compilation of information gained from other authors, but that it is dominated by the information which he himself has gathered from his active work in pathology and morbid anatomy, with such additions from other authors as may seem necessary from time to time. In other words, the book is written by a master and deserves all the success that books so produced should receive. We expect to use it constantly.

NOTES ON THE MEDICAL TREATMENT OF DISEASE. For Students and Practitioners. By Robert Dawson Rudolph, C.B.E., M.D., F.R.C.P. University of Toronto Press, 1921.

We are told in the preface that the aim of this book is to impress upon the student and practitioner broad principles for the medical treatment of the sick and to urge the importance and method of dealing with patients. Special emphasis is laid upon the fact that we are not dealing with disease, but rather with diseased individuals, which is quite a different thing. In other words, the question is not what is the treatment of pneumonia, but rather how can we best care for the patient so that he may recover from the disease. The book does not deal with drugs primarily but consists of thirty chapters, covering less than 500 pages, which discuss the treatment of various specific or infectious diseases, including those of the respiratory and circulatory systems, diseases of the blood and digestive systems, and of the kidneys. There is also a chapter upon the therapeutic use of oxygen and the present position of venesection. The closing chapters deal with the functional disorders of the nervous system and with some of the organic diseases of this portion of the body. The book does

not attempt to quote the writings of other contributors in practice and therapeutics except on rare occasions, but is a mirror of what Dr. Rudolph, who is the Professor of Therapeutics in the University of Toronto, believes to be the proper method; or, in other words, the text represents the manner in which he would treat the conditions which he clearly describes and for which he equally clearly indicates the remedies which he believes to be most advantageous. For these reasons the reader is provided with the guidance of one who is recognized as foremost in the department of therapeutics.

GENERAL PATHOLOGY. By Dr. Ernst Ziegler. Revised from the 11th German edition of 1905 by Douglas Symmers, M.D. Illustrated in black and white and colors. William Wood & Company, New York, 1921. Price \$7.

For a generation Ziegler's Pathology has been one of the standard works of medicine, and the present American edition has been revised by the Director of Laboratories in the Bellevue and Allied Hospitals, who was formerly Professor of Pathology in Bellevue Medical College, and who is known because of the vigor and accuracy of his work and the numerous contributions which he has made to medical literature within the last few years, utilizing to the full the opportunities which he has had in the Department of Pathology.

The present American edition has been reprinted. Care has been taken to make the English more concise and clear. A number of conditions which have become recognized in the last few years, or concerning which our information has greatly broadened, are thoroughly considered. Many of the old original illustrations have been eliminated, and in their place photographic reproductions from the wards and laboratories of Bellevue Hospital have been introduced. Much space is saved at times by the use of fine print in discussing subjects which are not of prime importance.

The book shows a wide familiarity with current pathological literature, and while a large amount of the bibliography refers to Teutonic work, nevertheless one feels the

presence of the American editor by his frequent introduction of English and American references, which add very materially to the value of the volume. If the German publisher would bring out a German translation of the American edition, Teutonic pathology would be materially improved.

CLINICAL OPHTHALMOLOGY FOR THE GENERAL PRACTITIONER. By A. Maitland Ramsay, M.D., with a Foreword by Sir James MacKenzie, M.D., F.R.S. Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C. 4, London, 1920.

Always the writings of Dr. Ramsay show the influence of the years he spent as "a general practitioner"—an influence which has ever enhanced their value. Richly illustrated, many of the plates being reproductions, and excellent reproductions in color, beginning with a full description of the methodical examination, the accomplished author has produced a book of forty-six chapters which covers the whole field of ophthalmology. Although the book was written for the general practitioner, it is one which should be in the library of every ophthalmologist, who, no matter how wide his experience may be, will find much of importance and satisfying interest. Dr. Ramsay's aim has been, to quote his own words, "to indicate, as far as possible, the cases which the general practitioner can treat safely on his own responsibility, and those in which it is desirable to obtain a consultation with an expert." No one, so far as the reviewer is aware, has ever covered the ground, from this standpoint, so elaborately. With this book in his possession, the general practitioner should never be at a loss what to do in an emergency, and the hope may be expressed that he would never fail to realize how necessary in most of the cases of ophthalmic disease and injuries it is his duty to avail himself of expert advice. Dr. Ramsay's rich experience, not only as a general practitioner, but for many years as an accomplished ophthalmic surgeon, gives this book a value which is peculiarly its own.

G. E. DE S.

A LABORATORY MANUAL AND TEXT-BOOK OF EMBRYOLOGY. By Charles William Prentiss. Revised and rewritten by Leslie Brainerd Arey. Third edition, enlarged, and illustrated in black and white and in colors. The W. B. Saunders Company, Philadelphia, 1920. Price \$5.50.

This book, originally written by the late Professor Prentiss and first published in 1915, has now reached its third edition, the rapid exhaustion of the second edition requiring that Professor Arey should busily prepare the text for the present issue. When it is stated that the book has been reprinted on several occasions in addition to the editions which have appeared, it is at once evident that it must be of value to teachers of this subject and to their pupils. It is printed on excellent paper, in large type. From the general standpoint, possibly the most noteworthy feature is the excellence of definition in the illustrations, practically none of which are blurred, so that they clearly represent what is seen under a properly adjusted microscope. In many books the reverse is true, and students are disappointed. The book is so attractively printed and the illustrations are so interesting that even those who are not particularly interested in embryology will, if they pick it up, be inclined to read it. While regret is necessarily felt that the skilled author of the original volume could not aid in the preparation of the present edition, nevertheless the present editor has made us recognize the well-known fact often spoken of in military service, to the effect that no one is so good at anything that in the event of his passing away some one else cannot be found to carry on the work.

A SYNOPSIS OF MEDICINE. By Henry L. Tidy, M.A., M.D., F.R.C.P. William Wood & Company, New York, 1921. Price \$6.50.

This is a book in which the author has attempted, as he says in his title, to provide a synopsis of such principles of medicine as are of importance at the present time. The general arrangement follows that of Osler's "Practice." In other words, it is what might be called a Practice of Medicine boiled down, and for this reason is anything but readable. It is, however, a book to which the physician may turn when he

wants a summarization in a few lines of all the facts concerning most of the conditions which are met with in practical medicine, the more so as it has quite an exhaustive index. Possibly the best way to explain the arrangement of the text is to state that it is like an extended table of contents of an encyclopedia, or to say that it is a book upon the Practice of Medicine concentrated until nothing but cold facts are given in brief sentences and paragraphs.

TROPICAL OPHTHALMOLOGY. By Robert Henry Elliott, M.D., B.S. (Lond.), Sc.D. (Edin.), F.R.C.S. (Eng.). With 7 Plates and 117 Illustrations. London: Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C., 1920.

This volume, the first of its kind on Tropical Ophthalmology, is a welcome addition to the text-books on ophthalmic science. Indeed, it is much more than a "text-book," in that it contains a careful reference to, and an analysis of, the literature of this subject, the wise comments of the accomplished author, and a record of his own extensive experience. The material is classified in ten sections, wherein are discussed, among other subjects, the ocular effects of strong light in tropical countries; the effects of exposure of the eye to wind and dust, including an account of the development of pterygia and the causation of ophthalmia epidemics; injuries of the eye by animals in the tropics; and parasitic diseases of the eye. Naturally, the Indian operation of couching for cataract and the methods of extraction of cataract in India receive full consideration. A special chapter by Col. H. Kirkpatrick on the Madras cataract operation is included in this section. This author also contributes a chapter on the ophthalmoscopic appearances in the tropics. Diseases of the cornea, conjunctiva, lids and lacrimal passages are described, especially from the tropical standpoint, and the book concludes with a discussion of general diseases and their ocular manifestations, such affections as beriberi, leprosy, trypanosomiasis, malaria, and relapsing fever being of special interest. This work is of great value to all ophthal-

mologists, but especially to those whose duties take them to tropical countries. It should be especially valuable to the medical officers of the Army and Navy. Colonel Elliot has done much for the advancement of ophthalmic knowledge, and ophthalmic practitioners in all countries, already largely in his debt, will welcome this new and admirable contribution from his facile pen.

G. E. DE S.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By James M. Anders, M.D., LL.D. Fourteenth edition, thoroughly revised. The W. B. Saunders Company, Philadelphia, 1920. Price \$10.

The fourteenth edition of this very successful book on the Practice of Medicine has been revised by Dr. Anders with the assistance of Dr. John H. Musser, Jr., who also was engaged with him in the revision of the earlier edition. The first point that strikes one in taking up the volume is that although it contains approximately 1300 pages, the paper is so thin that the book is no larger or heavier than many volumes which contain half the text. At the same time the publishers have been successful in obtaining a paper which does not show the register and, therefore, there is no blurring of the type.

Any book which has reached its fourteenth edition in 24 years, and has been reprinted a number of times, must possess certain essential qualities which have made it useful to practitioners in general. The present edition bids fair to maintain the popularity of the work. It is a reliable, essentially practical, and therefore a most useful book covering a wide field in practice.

THE ROENTGEN DIAGNOSIS OF DISEASES OF THE ALIMENTARY CANAL. By Russell D. Carman, M.D. Second edition, revised. The W. B. Saunders Company, Philadelphia, 1920. Price \$8.50.

The author of this book, who is the head of the Section on Roentgenology in the Division of Medicine, the Mayo Clinic, in bringing out the second edition, has added 98 pages to the volume and 122 illustrations. There are two new chapters: One is upon Hour-glass Stomach and the other provides a chronological abstract upon the

published work on pneumoperitoneal diagnosis of abdominal lesions. The object of the author has been to arrange in a systematic manner the results of his own experience in such a way as to be of value to those who are interested in this subject, not only as active roentgenologists, but as general medical and surgical clinicians.

The book naturally opens with preliminary pages upon the apparatus which is used, the methods of examination, directions as to feeding, and details as to technique of examining different portions of the body. Quite full bibliographical references are attached to almost every chapter and full credit is given to workers in this field in this country and abroad. The illustrations will, we think, be particularly useful to the clinician who is not practicing roentgenology, since when plates are sent to him by the *x*-ray expert he will be the more able to utilize them in reaching a diagnosis, in that he will be familiar with actual pathological changes and not confuse them with alterations in position and shape which the skilful roentgenologist regards nevertheless as normal.

PRACTICAL PSYCHOLOGY AND PSYCHIATRY. By C. B. Burr, M.D. Fifth edition, revised and enlarged; illustrated. The F. A. Davis Company, Philadelphia, 1921. Price \$2.

Dr. Burr has provided this book for use in training schools for attendants, nurses, and for medical students. He hopes it will be valuable as a ready reference for practitioners. In his fifth edition he has not only carefully revised the text, but paid particular attention to the chapters on Psychiatry and the Forms of Insanity. A new chapter on the Prevention of Insanity has been incorporated. The classification follows that recommended by the National Committee for Mental Hygiene.

We have no doubt that the book will prove of value, as it is intended, for the class of people for which it is designed. It is much too elementary for the trained neurologist and alienist. The fact that it has reached a fifth edition since 1898 indicates that it has proved of value to the readers for whom it has been prepared.

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Original Articles

Truths and Fallacies About Appendicitis¹

BY JOHN B. DEEVER, M.D.

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Since the day when Reginald Heber Fitz revealed the true cause of disease in the right iliac fossa the interest aroused in appendicitis has continued almost unabated throughout the four decades that have passed since that time. A great deal of the attention bestowed upon the disorder was the result of persistent propaganda maintained by those who were from the first convinced of the correctness of Fitz's theory and the rationale of the treatment advocated by him. It was not easy to impress the truth upon the prejudiced professional mind and to eradicate the fallacies, many of them still prevalent, concerning this insidious and protean disease. To its protean character no doubt much of the difficulty of effectual propaganda and many of the fallacies concerning the disease were due. There is probably no other disorder an analysis of whose symptoms would cover so many of the body systems as appear in an analysis of appendicitis, both in its acute and chronic form. The tendency of acute appendicitis to mimic nearly every other acute abdominal condition provides unlooked-for pitfalls in diagnosis. Not only that, but even when diagnosed its course is insidious and treacherous, full of snares and dangers which only experience and prompt, energetic, rational treatment can avoid. Prob-

ably the most striking illustration of this point is the fact that very often a case of acute appendicitis, which to all appearances is subsiding, is actually lying low for a final flare-up armed with the deadly weapon of gangrene or perforation. No doubt every one has on many occasions successfully carried a patient through one or more attacks of acute appendicitis. But it has been done at a great risk—how great the risk, only the surgeon who sees the disease in its actual course can tell; and how many deaths from acute appendicitis are attributed to surgery instead of to procrastination, only the surgeon, and the procrastinator, can tell. Each, however, keeps his counsel in the matter.

Therefore I have always said be wary of the dangers of perforation and gangrene in a case of acute appendicitis. It is fallacious to suppose that incipient or actual perforation always manifests itself by violent onset of symptoms or by aggravation of existing symptoms. Almost daily the surgeon sees the error of this reasoning, but nevertheless he continues to have cases brought to him which at operation demonstrate either perforation, gangrene, or pus, and the attending physician, who has accompanied the case to the operating table, expresses satisfaction, I had almost said joy, at the revelation!

I have on so many occasions preached against that other fallacious procedure of

¹Read before the Northern Medical Association of Philadelphia, November 12, 1920.

purging the acute abdomen that I scarcely have the courage to do more than mention it, especially as I believe the custom is on the wane. Nevertheless about one-fourth of the cases of acute appendicitis admitted to the Lankenau Hospital are associated with either abscess, perforation, or gangrene, or all of these complications; about 90 per cent of these give a history of purgation.

The use of local applications, either hot or cold, is also fallacious. The expression "freezing out the appendix" is frequently heard, and needless to say is not only nonsensical but absolutely absurd. An ice-bag may do good from the psychological standpoint, if we are to believe the patient's statement; and if no harm results from its application we must be satisfied at that, but we must not delude ourselves that it has had any actual local effect. The great drawback to the use of the ice-bag is the danger of wetting the patient's clothing and the bedclothes, especially the mattress. If care is taken to prevent this mishap there is no reason why it should not be used, with judgment of course, being careful to avoid destroying the vitality of the skin, since necrosis has been known to follow this practice. The rationale of relief, if there is such, is the anesthetic effect of extreme cold. The same applies to hot applications. The relationship of the surface of the abdomen at the site of the appendix to the deep-lying organ is so remote as to cast doubt on the efficacy of such local remedies. On the other hand, the application of cold, especially if prolonged, prevents the same satisfactory palpation as when the tissues have been left in their normal condition; and palpation it is well known is of great importance, since by this means only the skilled touch can often arrive at a conclusion.

With regard to chronic appendicitis, probably the most prevalent fallacy is that diagnosis is always easy. The truth of the matter is that it is not. Confusion with other upper abdominal conditions, with genito-urinary and pelvic disease, is liable

to occur to the most astute and experienced diagnostician. In fact the frequent association of appendicitis with one or the other of these abdominal conditions has led to the question of cause and effect, a question which is by no means settled beyond doubt. Some authorities are convinced that such a disease as cholecystitis, for example, is the cause of disorders. The common cause no doubt is infection usually residing in the appendix itself.

You would probably consider it fallacious on my part to trace a connection between rheumatoid arthritis and appendicitis. But the relationship is not so remote as would seem. The feature most prominent in all cases of appendicitis is constipation. That autointoxication often results from neglect of this symptom is generally conceded. This autointoxication may lead not only to pathologic changes in the brain, the suprarenals, and the liver, and give rise to neurasthenic symptoms so often accompanying chronic appendicitis, but may even develop into a true bacterial infection, such as rheumatoid arthritis. I have in mind an instance (already quoted on another occasion) in which the relationship between the latter and a history of frequent attacks of appendicitis was so apparent as to establish it as a condition and not a theory. I do not stand alone in this observation. Rolleston¹ has recently referred to the association of the two disorders and agrees with Poynton, who considers the arthritis secondary to the appendicitis.

It is true that this is an extreme and perhaps rare occurrence, but it serves to emphasize the fact that diagnosis is beset with snares, especially because of the frequency of what we know as referred symptoms. This item of referred symptoms has led some authors to question the propriety of classing these cases with those of true chronic appendicitis, and to invent the term pseudo-appendicitis for this type of case. Why the "pseudo?" Why not tell

¹Rolleston: *B. M. J.*, 1920, i, 817.

the truth and say the symptoms are puzzling, but the underlying cause is in all likelihood the appendix; then prove your stand at the operating table, and if it is not appendicitis find out what it is and give it a real name.

Another fallacy is that the pathologic condition of the appendix bears a constant correspondence to the duration of the symptoms, and therefore one need not be in a hurry in advising operation.

The observation has been made that early carcinoma of the cecum often gives rise to symptoms of appendicitis. Furthermore, carcinoma of the appendix, *per se*, presents no other symptoms than those of ordinary acute or chronic appendicitis. In fact I have on several occasions removed appendices as a routine measure, which microscopically proved to be carcinomatous, and which clinically had never presented any symptoms whatever. These conditions, fortunately rare, must be reckoned with, and also other untoward possibilities resulting from disease, all the more so in view of the ease and safety of the operation of appendicitis.

As to the operation itself, it is perfectly natural and justifiable that the personal predilection of the habitual surgeon for a method which has given him the best results should be the one advocated by him. It is for this reason that recent literature has been presenting various types of operation suitable for this disorder. Personally I can say nothing for or against them, having obtained perfectly satisfactory results with the methods I employ. The important thing is for the profession to recognize the truths about appendicitis, and for the surgeon to do the rest to the best of his ability.

In closing this discussion I have thought it not out of place to consider for a few minutes the terminal stage of acute appendicitis—peritonitis. It is understood that in every case of acute appendicitis in which the inflammatory process involves the serous coat there is a limited peritonitis in which serum is the inflammatory exudate:

this is seen in the mildest cases where there is fever and a slight leucocytosis. In many of these cases to the inexperienced eye, the appendix does not seem to account for the condition, especially when we realize that the slightest peritoneal irritation results in the exudation of a serous fluid, the amount of which is commensurate with the degree of irritation, whether it be wide-spread or not. Normally the peritoneal cavity does not contain anything—that is, it is empty, the endothelial layer of the serosa being covered by a thin film of lymph; this tells us that in the presence of fluid in the cavity there is pathology.

Peritonitis is met with as circumscribed or diffused. In the presence of a circumscribed peritonitis and a localized definite point of extreme or exquisite tenderness, as in the presence of an actually inflamed, perforated, or gangrenous appendix, there being no constitutional or other contraindications, operation can be successfully done if the proper technique be observed, which, in short, means safeguarding the surrounding peritoneum against contamination by the proper disposition of gauze packing. The appendix having been removed, the introduction of drainage properly placed and closing the wound up to the exit of drainage, or putting in no stitches at all, completes the operation.

In diffuse or spreading peritonitis in the absence of a localized and definite point of distinct tenderness and the absence of peristalsis (a silent belly), the logical course to pursue is to let the patient alone operatively. The treatment therefore is to wash out the stomach and repeat the washings if there is nausea, vomiting, hiccough, or regurgitation of foul material, or there be great distention of the stomach. Normal saline solution by rectum, the Murphy method, ice-bags to the abdomen, morphia if there is pain, and nothing by mouth until there is restoration of peristalsis as told by auscultation of the abdomen or by the passing of flatus, is the only rational treatment—in fact the only treatment—if the best interests of the patient are to be

served. The best position for the patient is the sitting position, sling and pillow beneath the buttocks, with the pillow between the latter and the sling, and the back supported by pillows. If the condition of the patient is asthenic the addition of expressed beef juice and whisky to the normal saline solution is of benefit.

Those who operate in the presence of an acute, spreading, diffusing peritonitis after the first twenty-four or thirty-six hours of the onset of the peritoneal inflammation are not serving the best interests of the patient in the majority of instances, therefore will record a higher mortality than is warranted, as borne out by the experience of those surgeons who have and are still seeing the largest number of cases of this type of the acute abdomen. I am fully aware that an occasional case will get well in spite of the precipitous and ill-advised operation, yet this proves nothing other than that the operator has given the lucky patient a chance not to get well. Judgment is a much better asset for the surgeon than is operative skill; the combination of both makes the master.

The statement I so often hear expressed, "I operate all cases of acute appendicitis as soon as I can after I see them, mattering not how long or how sick they are," tells me at once to which class of surgeons the particular operator belongs. I am sorry I cannot write in a more complimentary way, but I write the truth as I see it.

In abscess cases treated as open wounds that have already filled in I do not close with suture. This practice does not prevent a subsequent hernia. In my experience all these cases have a hernia later. I think it is the better practice to repair the deformity when the tissues have recovered their normal. Before the repair of the hernia the wearing of an abdominal belt does but little if any good, other than the general support it affords.

In badly infected cases, in which the peritoneum in the immediate neighborhood of the appendix is green, and the pus, if

present, is foul smelling, it is best to surround the infected cavity with rubber dam or oiled silk and lightly pack gauze into the enclosure, leaving the wound open, but carrying silkworm-gut through the margins of the wound and tying loosely to prevent the escape of the intestines. This packing is not removed for several days. If, in addition to the coffer-damming, rubber drainage tubes have been placed in the subhepatic space or between the diaphragm and the liver, and a glass tube in the pelvis, the latter should be removed when the contents, as told by aspiration, have become straw-colored. Should the glass tube contain pus at the end of twenty-four hours, it should be removed and replaced by a rubber tube carried down into the pelvis through the glass tube and the latter taken out by revolving it around the rubber tube. At the end of four to six days the rubber tube can be gradually withdrawn a little at a time, the projecting end cut off until it is entirely removed in three or four days' time. This is a very important part of postoperative technique. When the gauze making the coffer-dam is removed it should be soaked with hypertonic salt, or normal salt, solution before and when being removed. Removal of the gauze brings as a rule the sheet of rubber dam or oiled silk with it. The wound is lightly packed with gauze, healing taking place by granulation. Of course all of these patients have hernia, but a living patient with a hernia is better than a dead one without a hernia.

All cases of acute appendicitis do not present a clear diagnostic picture. In the upper abdomen the gall-bladder, pancreas, acute perforation of a duodenal or gastric ulcer, pyelitis particularly in women, internal hernia, a movable right kidney temporarily anchored, strangulation of a limited portion or of the whole omentum due to a twist on its long axis, a limited inflammation of the omentum, hematogenous infection of the right kidney, and, in the lower abdomen, diverticulitis of the sigmoid as well as an acute inflammation of Meckel's diverticulum, acute disease of the uterine

appendages, twisted-pedicle cyst, ruptured ectopic pregnancy, and so forth, may cloud the diagnosis.

I believe that, other things being equal, in all abdominal operations the appendix should be removed. I have upon a number of occasions in the past had to operate for acute appendicitis during convalescence from an abdominal operation where the appendix had not been removed. The following case illustrates this point: Operation, circular resection of the stomach for ulcer in a patient well along in years. I deemed it the part of better judgment not to remove the appendix. Three days following operation, peritonitis in the lower abdomen, which I was inclined to believe was the result of leakage from the stomach wound. Operation revealed a perforated appendix occupying the pelvis, with pus. Recovery prompt and uneventful.

TREATMENT AFTER OPERATION.

As a rule there is very little to do after operation other than to continue that practiced before. No purgative or aperient medicine should be given until the patient passes flatus, which indicates that the peritonitis, if present at the time of operation, is on the wane or the height of the wave has been reached, and that this sound, so joyfully heard under these conditions, tells the storm is passing or has blown over and there will be clear sailing from now on. How easily and oftentimes can the storm be made to return by the ill-advised and occasionally fatal dose of purgative medicine. The lower bowel may be emptied by an enema gently given and nothing more. The upper bowel will take care of itself and will empty soon after nourishment is

given by mouth, that is if not given until after the establishment of normal peristalsis. Can I say more? It is not necessary if the normal and the pathological physiology of the alimentary canal are understood.

I wish to sound a note of warning against allowing sanctioning, advising, arguing with the patient, parent, or guardian as to not operating immediately or shortly after the recovery from an attack. I so frequently hear this advice given that I shudder at the boldness of he who so advises. The greater one's experience is the more he realizes how dangerous such advice is. How often have I been called to operate a patient in the second or third attack where this advice was given after recovery from the first attack, to find the patient dying from a peritoneal toxemia. Every individual the subject of an attack of acute or subacute appendicitis should be operated upon, if not during, then immediately after recovery from the attack. Many a precious life has been sacrificed by this pussyfooting. He who waits is waiting for an overt act, a policy that cost many lives in the World War, but I question if any more than have been sacrificed in the appendiceal war still raging. He who gives such advice is gambling with human lives, a damnable policy. Second only to this advice is purging the bowel in the acute abdomen, which often makes out of that portion of the peritoneal cavity in communication with the lumen of the appendix through the perforation a cesspool, a toilet. How horrible! I have not magnified this appendiceal picture. I question if I have painted the picture strong enough to always assure its recognition.



The Drug Armamentarium of the Endoscopist

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The relief of conditions which the endoscopist is called upon to treat is usually accomplished by manual mechanical procedures, so that the number of drugs he employs is limited. There are a few drugs, however, whose indications and contraindications deserve special comment, since they may be of the greatest help to the patient and the surgeon, or when improperly or inopportunistly employed may result in danger if not fatality.

Anesthetics.—The question of the use of general anesthetics in endoscopic procedures must be decided by the operator with reference to his experience and degree of skill in this particular kind of work, and secondly with regard to the temperament of the patient. The endoscopist must determine what is best for that particular patient under the circumstances then existing. In the Bronchoscopic Clinic, general anesthesia is never used. The coöperation of the patient during the endoscopy offers the greatest advantage; even little children will cough or hold the breath when requested and in many ways facilitate the work.

If a general anesthetic is to be used ether is perhaps the safest to select. The anesthesia should be started in the usual way with the gauze or cone face mask and pushed to the point where the lower jaw muscles are relaxed so that the mouth can be opened, without force, sufficiently to allow the insertion of the laryngoscope and through it the bronchoscope. Ether vapor is now insufflated into the bronchoscope through the small branch tube by means of the vaporizer shown in Fig. 1. Chloroform can be used in the same manner, but

because of its greater depressant action on the respiratory and cardiac centers its use is attended by greater risk.

Nitrous oxide with oxygen may be used to initiate the ether anesthesia, but it has been known to create marked rigidity of the jaws, which greatly interfered with the insertion of the endoscopic tubes. Insufflation of the mixed gases through the bronchoscope has also been tried with a variable degree of success; the free mobility of the head, neck, and shoulders necessary to endoscopic work is, however, often impaired by the tendency to rigidity mentioned above. It is usually necessary to

FIG. 1.—Dosimetric anesthetizing attachment for the bronchoscope. Devised by Dr. T. Drysdale Buchanan. The small branch tube ends in the lumen of the bronchoscope, and not in an auxiliary canal. All of Jackson's bronchoscopes are now made with this small branch tube, as it has been found very useful for bronchoscopic oxygen insufflation.

obtain relaxation by the addition of a small amount of ether to the nitrous-oxide-oxygen mixture.

It is a fundamental precept that dyspnea is a contraindication to the administration of a general anesthetic. If a dyspneic patient be given a general anesthetic respiration will cease with the inhibition of voluntary muscle control, and the consequent loss of the aid of accessory muscles of respiration. Emergency tracheotomy

may then be required, unless facilities are at hand for bronchoscopic insufflation of oxygen and amyl nitrite.

Narcotics.—Great help is afforded in bronchoscopy by the lessening of the excessive cough reflex caused by the presence of the tube and the manipulation within the air-passages, and by allaying any undue apprehensions which the patient may have. For this purpose the derivatives of opium are invaluable. Preceding laryngeal operations and bronchoscopy in the adult it is our practice to give from $\frac{1}{4}$ to $\frac{3}{8}$ of a grain of morphine in combination with $\frac{1}{150}$ of a grain of atropine hypodermically one hour before operation. Children, contrary to our former views, seem to stand opiates well, and we have found that $\frac{1}{8}$ of a grain of morphine guarded with $\frac{1}{200}$ of a grain of atropine, given a well-developed child of five years one hour before operation, greatly subdues the excitability and the tendency to excessive coughing. Younger children are given proportionately smaller doses, while infants may be given 2 to 4 minims of laudanum or a corresponding dose of paregoric. This providing the patient be not dyspneic, for narcotics as well as general anesthetics are contraindicated when any difficulty in breathing exists. As Chevalier Jackson has said, "The cough reflex is the watch-dog of the lungs," and if not drugged asleep may be depended upon to rid the lower air-passages of any contained or aspirated secretions. Furthermore the opium preparations are direct depressants of the respiratory function and tend to inhibit the exercise of the voluntary accessory muscles of respiration upon which life at this time may be dependent.

Morphine and atropine inhibit the secretion of the salivary and mucous glands and thus help to rid us of this source of annoyance during the operation.

These drugs and other antiechics are, however, never to be given to children after bronchoscopy, and particularly are they pernicious after tracheotomy. The thick-

ening and drying of the secretions which they cause render it almost impossible for the child to dislodge them from the air-passages by its feeble bechic efforts.

Scopolamine 0.00065 gm. with morphine 0.0324 gm. given hypodermically one hour before operation is a convenient anesthetic for foreign body practice work on a small dog. This dose may be repeated if necessary.

Local anesthesia is quite sufficient for laryngeal or bronchial manipulations in the adult, while no anesthetic or sedative is required for esophagoscopy on either the adult or child.

The use of cocaine is contraindicated in children under fifteen. It seems to have a particularly toxic and sometimes fatal action, and the numerous reports of death following the local application of a cocaine solution to the throat in children confirm the dictum against its use. Endoscopic procedures are not painful if skilfully and expeditiously performed, but if choice must be made between cocaine and ether, the latter will be the safer in children.

General anesthesia for tracheotomy is not only unnecessary, but its use in part accounts for the reports of the high mortality attending this life-saving operation. The danger may be primary, from asphyxia occurring when the voluntary use of the accessory muscles of respiration ceases; or secondary from aspiration of blood, pus, or secretions during the time the cough reflex is drugged asleep.

Tracheotomy requires only skin infiltration for its painless performance; there being little sensation in the deeper structures of the neck. Excellent anesthesia can be obtained by the intradermal injection of apothesine in a 2-per-cent solution. This drug has the advantage of allowing sterilization by boiling, and it has shown no toxic action even when used in quantities of a drachm of a 2-per-cent solution in an infant of seven months. The addition of adrenalin to the solution for infiltration anesthesia is of no advantage and is sometimes a distinct hindrance.

Vasoconstriction during tracheotomy allows us to overlook many small vessels which may be the source of annoying oozing some hours after the operation. It has further been suggested that some of the observed toxic effects accompanying infiltration anesthesia may perhaps be due not to the particular anesthetic drug used but to the adrenalin combined with it.

Schleich's fluid, novocaine, or 1/10-per-cent cocaine in normal salt solution may be used; the toxic effect of cocaine on children must, however, be kept in mind.

The injection of a cocaine solution into the lumen of the trachea, through one of the interannular membranes, for the purpose of preventing the coughing which occurs when the trachea is opened, is mentioned only to be condemned. Associated with dyspnea for which the tracheotomy is performed there is defective drainage and an accumulation of secretions in the lower air-passages. These secretions can only be removed by the bechic efforts of the patient, and if the cough reflex be not impaired the accumulated secretions will be expelled and any blood, pus, or other fluids will be prevented from entering the bronchi from without. Most tracheotomies are done on children in whom the use of cocaine is contraindicated.

Amyl nitrite will be found the quickest acting aid to the reestablishment of respiration in asphyxia. Amyl nitrite pearls should always be included in the surgeon's tracheotomy box.

In the Bronchoscopic Clinic, laryngoscopic and bronchoscopic procedures on the adult are attended with the following preliminaries:

1. A mild cathartic is taken on the day before operation.

2. Patient enters the hospital on the morning of the operation without breakfast, and is put to bed.

3. One hour before operation $\frac{1}{4}$ to $\frac{3}{8}$ of a grain of morphine sulphate with $\frac{1}{150}$ of a grain of atropine is given hypodermically. Care must be taken that the injection be not made into a vein.

4. In the operating-room the pharynx and epiglottis are twice painted with a 10-per-cent solution of cocaine, at intervals of about three minutes.

The direct laryngoscope is now inserted, and by means of a gauze swab on a long carrier the interior of the larynx and trachea is anesthetized with 20-per-cent solution of cocaine. Two applications are usually sufficient. Further anesthetization of the bronchi, if required, may be carried on in like manner by passing the swabs through the bronchoscope.

For esophagoscopy on either adult or child no sedative or anesthetic is used. No food or water should be taken for at least eight hours preceding the esophagoscopy.

Laryngoscopy and bronchoscopy in children are done without anesthesia, local or general. In selected non-dyspneic bronchial foreign body cases a small dose of morphine is given as mentioned under narcotics. Especial avoidance of narcotics and antibechnics is made in arachidic bronchitis cases.

After laryngoscopic and bronchoscopic procedures the inhalation of steam laden with the vapor of the compound tincture of benzoin is very soothing. It is advisable also to give in the evening a grain of calomel, followed in the morning by citrate of magnesia or magnesium sulphate. All cases showing any degree of dyspnea require constant watching by a special nurse. This is particularly important for the children who have had portions of nut-kernels removed from the bronchi. There here exists a peculiar intense, edematous, purulent inflammation of the larynx, trachea, and bronchi which we have termed "arachidic bronchitis."¹ Because of its swollen air-passages and feeble bechic powers, the child is unable to expel the thick, viscid, purulent secretion, and tracheotomy may be required to pipe air to the lungs and to drain the lower air-passages of the accumulating secretions.

Even when tracheotomy has been done,

¹Jackson, Chevalier, and Wm. H. Spencer: *Journ. Amer. Med. Assoc.*, Aug. 30, 1919, vol. 73, pp. 672-677.

constant watching and attention is necessary to aid in the removal of these thick secretions through the tracheal wound. It is necessary in some of these cases to actually aspirate the secretions from the trachea. We have found that the secretions are sometimes made more fluid and more easily expelled by dropping into the tracheal cannula a little of the following mixture:

Sodium bicarbonate, gr. 10;
Glycerin, drachm 1;
Normal salt solution (sterile),
enough to make ounce 1.

Ammonium carbonate has been used with benefit in these cases also. It has the double value of being a cardiac stimulant as well as an expectorant. Caffeine is also helpful as a respiratory stimulant. The internal administration of 10 grains of sodium bicarbonate at two-hourly intervals tends also to liquefy the tracheobronchial secretions. Every effort must be made to make the child cough and rid its bronchi of the secretions; from failure to realize this mechanical principle of "keeping the pipes clean" many a child has been allowed to die; the cause of its demise being ascribed to bronchopneumonia.

When there is a tendency to crust formation in the trachea with a rather scanty secretion, the instillation into the tracheotomy tube of a few drops of sterile liquid petrolatum will be found to help greatly.

The inhalation of steam impregnated with compound tincture of benzoin is very soothing whenever laryngeal inflammation exists. In children it is sometimes best used by directing the jet of steam into a croup tent, made by draping sheets over sticks fastened to each corner of the bed. If the patient is very dyspneic, however, the confinement, stuffiness and extreme humidity of the croup tent seems to increase the distress; in which case we dispense with the tent and simply vaporize the steam in the room, directing the jet over the bed. After tracheotomy it is helpful to use the steam vaporizer in the room at intervals for the first two or three days, especially in those cases in which

there is much tracheobronchial inflammation. The secretions seem to be kept somewhat more moist and are more easily expelled through the tube. If there is much tendency to dryness, however, the instillation of oil into the trachea will be found to afford greater relief and should be used in conjunction with the steam.

As a dehydrating agent in the watery edema of the larynx sometimes accompanying the exanthemata and seen in some types of nephritis, the careful, judicious hypodermic administration of pilocarpine has proved of value. It should be guarded by cardiac stimulation, and if edema of the lungs threaten its physiologic antagonist—*atropine*—should be promptly given. By producing free diaphoresis and salivation, the tissues in some of these cases may be so depleted of water as to produce resorption of the laryngeal edema and subsidence of the dyspnea, thus avoiding tracheotomy.

The high fever so commonly seen in foreign body cases has its only treatment in the removal of the intruder, as will be seen by the chart of a nine-year-old boy (Case No. Fbdy. 746) who had had a tack in the bronchus for one week (Fig. 2). Fever mixtures are of no avail, but hyperpyrexia, of course, calls for sponging and cooling applications to the head until arrangements can be made for the safe removal of the foreign body.

Bismuth subnitrate given dry on the tongue and swallowed without water, in doses of 10 grains every four hours, will coat over any abrasions or ulcerations in the esophagus produced by foreign body or other cause and will greatly relieve any pain therefrom. It has a slight antiseptic action which may be enhanced by the addition of about 1/10 of a grain of calomel to the dose. If a greater analgesic action is required, the combination of 2 grains of orthoform or anesthesin to each dose of bismuth subnitrate may be made. In esophagitis or esophageal ulceration the diet should be restricted to liquids until the acute inflammation subsides. The dissolving of bits of ice in the mouth will also give

great comfort in both laryngeal and esophageal inflammation.

Intrabronchial insufflation of dry bismuth subcarbonate through the bronchoscope has proven of considerable value in mapping out the bronchial tree in cases, in which a

enormous field for investigation of the action of the living cilia, in health and disease, the lymphatic drainage of the lung, and the mapping out of bronchiectatic and abscess cavities.¹

The local application of silver nitrate in 10-per-cent solution or of argyrol in 20-per-cent solution to ulcerations or erosions in the esophagus is very helpful in healing these lesions. It is not infrequently found that hiatal esophagismus (so-called cardiospasm) is associated with esophagitis, erosion, or ulceration of the esophageal or gastric wall; endoscopic application of one of the above mentioned drugs is indicated to heal the lesion before attempts at dilatation are made. In addition to the other medicaments found useful in the treatment of phrenospasm (so-called cardiospasm) we have found the administration of benzyl-benzoate 20-per-cent alcoholic solution to be of some aid as a supplementary to mechanical dilatation. It may be given in water, milk, or fruit juices, in doses from 20 to 60 drops, and seems to have a definite antispasmodic action, although we have observed no cure obtained from the use of the drug alone. Atropine, hyoscine, and bromides are helpful in some of the cases. Overdilatation remains the one tried and true means of cure in these sometimes trying cases. Relapses are prone to occur. Attention must be particularly paid to the underlying nervous condition which is almost always the cause of the condition.

The local application of diphtheria antitoxin to the trachea and bronchi after the bronchoscopic removal of obstructive diphtheric membrane has been the means of saving numerous lives which would have been lost in the prebronchoscopic days.

Bronchiectasis and lung abscess are much benefited and in certain cases cured by endobronchial lavage with warm normal salt solution or a solution of

Phenol, 15 grains;
Lugol's solution, 2 drachms;
Salt solution, 1 pint.²

FIG. 2.—Case No. Fbdy. 748. Chart of a boy of nine years showing the rapid return to normal of the temperature, pulse, and respiration after the removal of an upholsterer's tack from the right main bronchus, where it had remained for one week.

foreign body is far in the upper lobe bronchus, or in small bronchi that cannot be entered by the bronchoscope. No untoward symptoms have been observed, and the bismuth totally disappears from the lungs by expectoration in twenty-four hours. This method is available in an

¹Jackson: Trans. Amer. Laryn., Rhin., and Otol. Soc., 1918, p. 323.

²Mayer: N. Y. Med. Jour., Oct. 10, 1918.

About 10 ounces are used at each treatment—injecting slowly through the bronchoscope, and being removed by the drainage canal of the special model bronchoscope. Dichloramine-T has been suggested for use in the bronchiectasis, but Meltzer has shown that chlorine-containing compounds are particularly irritating to the lower air-passages, so that they should be cautiously employed and in very dilute solutions.

Gratifying results have been obtained in the treatment of gangrene of the lung by the intrabronchial injection of 20 to 25 Cc. of an oily solution of gomenol 1:10 or 1:5. Menthol 1:100 and guaiacol 1:20 in oily solution have also been used, but with not so beneficial an action. The injection is given after thorough cocaineization of the larynx and trachea.¹

Bronchial asthma has been treated with some degree of success by the endoscopic application of cocaine and adrenalin to the mucosa of the larynx, trachea, and bronchi. In cases which resist all other forms of treatment this method may be tried. Freudenthal recommends the injection into the bronchus of 10 Cc. of the following mixture at twice weekly intervals:

Orthoformi, 6.5;
Mentholi, 0.5;
Formalin, 0.5;
Ol. amygdal. dul., 15.0;
Gum acaciæ, 10.0;
Aque dest., q. s. ad., 60.0.

M. F. Emulsio.

Propæsin or anesthesin may be substituted for the orthoform. Novocaine has been employed instead of cocaine with good results. The simple bronchoscopic removal of secretion gives relief from the immediate symptoms, but has no effect on the recurrence of the attacks.

Cathartics should never be given when foreign bodies pass into the stomach and intestines, neither should the usual diet be in any way altered. The fecal mass should be of such consistence as to surround the foreign body and protect the mucosa from injury. Purgatives will liquefy the feces,

and feeding of unaccustomed foods to infants will cause gastroenteritis with like effect, thus defeating nature's protective efforts. If stimulation of bowel action seems necessary, this may be accomplished by a low enema or by a suppository. Ninety-eight per cent of foreign bodies which reach the stomach or intestines pass uneventfully per rectum if nature's efforts at protection are not thwarted by injudicious interference. It is, however, imperative that the progress of the object be watched daily with the fluoroscope and that a careful lookout be kept for signs of obstruction or intestinal perforation, which will require prompt surgical intervention do they occur. That the stools must be watched in the interim is understood.

A word should be said regarding the diet after gastrostomy done for feeding in cases of high degree of esophageal stenosis. It is not sufficient to place a tube in the stomach and depend upon milk as the only pabulum. Fruit and vegetable juices should be given daily for their vitamine content; strained soups and cereals, thinned mashed potato, meat juices and olive oil should be part of the diet. Sugar should also be placed in such articles as would ordinarily be sweetened, for sugar is one of our most concentrated foods. With such a varied diet the nutrition can be kept at a high level for an indefinite period.

Primary cancer of the lung and bronchi has been treated by the endobronchial and intravenous injection of the insoluble sulphate of radium.¹ It has been shown that the suspended particles of the insoluble salt are arrested in the pulmonary capillaries and remain there for more than a year. An appreciable diminution in the congestion and size of the tumor and a lessening of the hemoptysis has been reported, but no cures have been effected.

Whooping-cough,² so long considered one of the general infections of childhood, has recently been suggested as properly

¹Guisez: Bull. D'Oto-Rhino-Laryngol. et de Broncho-Oesophagos. Tome xviii, No. 1, September, 1919, p. 9.

²Yankauer: Trans. Am. Laryn., Rhinol., and Otol. Soc., 1920, p. 220.

¹Guisez: *La Presse Médicale*, Feb. 26, 1921, p. 162.

placed in the realm of the laryngologist, since its lesion, when uncomplicated, is found to consist only in an acute inflammation of the larynx. Great amelioration of the number and severity of the laryngeal spasms has been observed to result from the intralaryngeal injection of a four-percent solution of antipyrin. A daily injection is given in children with the aid of the direct laryngoscope, at which time

thirty minims of the solution are directed upon the vocal cords. If seen early it is claimed that the disease may be aborted. In any case the period of the disease is greatly shortened by this method of treatment. Pertussis in the adult may be treated by dropping the solution of antipyrin into the larynx from a curved laryngeal dropper, using the mirror as a guide.

The Diagnosis and Treatment of Conditions of the Heart Complicating Pregnancy

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It is no uncommon occurrence to have a young woman in her first pregnancy develop a heart murmur and complain of irregular and rapid action of the heart. On examination, her attending physician may find a murmur which it is difficult to localize, but which may usually be referred to the mitral area. The pulse is rapid, its tension variable, often slightly raised. The examination of the urine may be negative, but a slight serum albuminuria may be present. The pregnancy may be progressing normally so far as the growth of the uterus and its contents is concerned. Shall a diagnosis of valvular disease of the heart be made? And if so, what measures shall be taken to safeguard the patient?

The question naturally arises as to whether the history of the patient will give a positive answer. In some cases a severe or repeated attacks of rheumatism in early life may be present; in others, chronically enlarged tonsils or repeated attacks of tonsillitis until the tonsils are removed; in some patients a chronic condition of ill-health, whose exact cause is not clear.

The difficulty arises in making a positive diagnosis of organic disease of the heart in the presence of the clinical findings already quoted and the presence or absence of the history narrated.

It may make this matter clearer if we recall for a moment the physiology of pregnancy. Those who have studied the subject carefully estimate that during pregnancy the blood increases one-twelfth in volume. The old belief that the heart hypertrophies is now usually denied. Some enlargement of the left ventricle may be present, but a distinct and essential hypertrophy cannot be proven. Obviously, the growing tumor in the abdomen must alter the physical conditions of the circulation, and the result of the increased quantity of blood, increased demand upon the heart, and the altered physical conditions is to favor the occurrence of moderate dilatation of the heart and its consequences. So far as we now know, this is the rational explanation of the indefinite murmurs and somewhat rapid and disturbed action of the heart often seen in pregnancy in those women who are not perfectly sound.

The general examination of a pregnant patient should always include an examination of the heart and the vascular system by taking the blood-pressure and observing the presence or absence of dilated veins. In cases in which the conditions already reported are present, without reason to believe that organic disease has developed, the hygiene of pregnancy should be strictly

enforced. It is of especial consequence in these cases that constipation and toxemia be avoided. Such remedies as promote the peristalsis of the intestine and encourage its daily and thorough evacuation should be employed. Moderate exercise freely in the open air, abundant rest, including a good night's sleep and an hour or two about midday, are all necessary, and the influence of cool bathing by sponging or rubbing upon the peripheral circulation should not be neglected. Toxic foci in the nose, throat, teeth, thyroid, appendix, gall-bladder or Fallopian tubes should be dealt with. The use of drugs is rarely necessary, but the nitrogen partition of the urine, a 24 hours' specimen, or the examination of the blood for its protein substances, is important. Diet should be regulated in accordance with the temperament and digestive power of the patient and the results of the study of metabolism. These patients are bad subjects for infection, and during epidemics of influenza they may become severely ill. Under ordinary circumstances, if the patient has a naturally sound constitution and her hygiene is good, such a condition is in no way serious and will gradually disappear as pregnancy advances.

In considering actual lesions of the heart complicating pregnancy attention must be first drawn to those of congenital origin. One thinks at once of the patulous foramen ovale, but this is not the important congenital lesion in these cases.

When the foramen ovale does not completely close, the individual is left with a mixed blood imperfectly aerated. If this condition is pronounced, the general resisting power of the patient is so diminished that she falls an early victim to infection. Few of these girls live beyond puberty, and hence these cases are very rarely seen in parturient women. In the milder grades, where the asphyxia is slight, patients show a surprising tolerance to the condition. They may grow to adult life and bear children successfully.

The most important congenital lesion in these patients is that affecting the mitral

orifice and producing mitral stenosis. This may arise from a congenital malformation, and if the abnormality be slight, it may not become apparent until delivery or after the patient's labor. The same is true of aortic insufficiency, which may show no sign until the patient comes to the test of labor. In some cases through lack of development the coronary arteries supplying the heart are abnormal or deficient, and corresponding lack in the normal blood supply of the heart is present.

A careful history of pregnant patients is very useful in detecting congenital abnormalities of the heart. If the child has not been able to share with others in active exercise, or if the child has had an obstinate anemia, with enforced rest, a suspicion should be excited that a congenital heart lesion may be present.

The diagnosis of such condition is made by a thorough and careful examination and by the study of an accurate history of the patient's previous health. When such a condition is found, attention should also be given to the peripheral circulation. In some cases the vessels themselves are diseased, and in others a disordered condition of the heart produces a chronic state of derangement in the vessels. Where there is discoloration of the skin to any marked degree, and this is not the result of some infection or pigmentation, one must be suspicious that the circulation is at fault. In cases of congenital heart lesion, the skin symptoms are important, for if they be present it is a sign that compensation is not maintained. The patient may be able to take her customary exercise, but the abnormal color of the skin will indicate that the peripheral circulation is badly supported. On the other hand, in these congenital cases, if there be no asphyxia or discoloration of the skin, it is evidence that decompensation has not occurred.

A patient with a congenital heart lesion complicating pregnancy should follow a strict hygiene. Probably the first question put to the physician will be, if the patient is not married, whether marriage is justifi-

fiable in view of the risks accompanying pregnancy. The answer to this must depend entirely upon the circumstances of the case. If the patient is young, of good general health and without distinctly bad heredity, if no other lesion can be found, if she is so situated that she can and will carry out directions for hygiene, then a favorable prognosis may often be given. If, however, these conditions are not present, conception would be accompanied by a very considerable risk to life and a positive risk to health. It must further be remembered that each pregnancy and parturition, to a woman having a heart lesion, means injury to health and often the shortening of life. To this rule there is practically no exception.

If pregnancy occurs in a woman with a congenital heart lesion, what should be her care? First in importance the avoidance of toxemia; regulation of the diet; plentiful use of water; proper attention to the functions of the bowels; outdoor exercise; rest, and the correction of anemia, if present—all these are matters of very great importance. Daily rest at a regular time, in addition to good sleep at night, is imperative. Patients should be thoroughly examined at least once in two weeks, and should discoloration of the skin, rapid or feeble heart action, disturbance in breathing or other essential disturbance develop, pregnancy should be terminated immediately.

In acquired diseases of the heart complicating pregnancy, the most unimportant is mitral regurgitation. This often follows rheumatism in childhood or at adolescence. Sometimes there is no rheumatic history, but in place repeated attacks of tonsillitis. On examination the usual signs of mitral regurgitation are present. The presence of a murmur over this area is not of primary importance in diagnosis, prognosis, or in suggested treatment. The question is not the presence or absence of the mitral lesion, but whether compensation is present.

In the case of a young woman of good general constitution with no history of loss of compensation or distress, a mitral regur-

gitation of moderate development is of little importance in pregnancy or labor. The patient's general health should receive careful attention, especially with the view of avoiding the development of toxemia. Exercise in moderation and in the open air under good conditions should be encouraged. The general hygiene of pregnancy should be strictly enforced and especial attention must be given to ample rest for the patient. Signs of danger would be in irregular, rapid and laboring action of the heart and increase in the extent and severity of the symptoms.

Should compensation rapidly fail in mitral regurgitation cases, the indication at once arises to terminate the pregnancy. This should be done in the manner least calculated to bring strain and suffering upon the patient. If the patient be a multipara, with dilated and dilatable birth canal, it might be possible to bring on labor by introducing an aseptic rectal tube in the lower segment and cervix, or possibly by the use of bougies. While labor is developing, the patient should be kept free from pain by the use of morphine and atropine hypodermically. Bags should not be employed, as they tend to produce severe suffering. If the patient's dyspnea is severe and she suffers greatly from oppression, in multiparæ it would be sufficient to rupture the membranes and to give morphine. The patient would gradually come into labor without great distress. If the patient is a primipara, not young, and with a long and resisting cervix, no attempt should be made to induce labor. If symptoms are so urgent that prompt delivery is demanded, the method of election is the performance of Cæsarean section. In multiparæ where the cervix is not yielding because of scar tissue, a similar indication arises.

If section is to be the mode of delivery, the question of sterilization must be considered. In women who have children, who are about forty years of age, in whom the heart has failed considerably in strength during the pregnancy, it is best to deliver by section, accompanied by sterilization. In

women who have no children and who are comparatively young, this should be avoided. Sterilization is to be effected at the request of husband and wife and with the approval of a physician of experience and skill in obstetrics.

The method of anesthetizing will require special consideration. If compensation has badly failed, it will be safest not to secure anesthesia by inhalation. Local anesthesia is the method of choice, accompanied by sterilization, and this may be done as in the following case:

A woman, aged about twenty-five, had borne one child in spontaneous labor. She had developed an aortic lesion and also a mitral stenosis early in her second pregnancy. Compensation had been good, but the lesions were so much worse than in the first pregnancy that the labor was dreaded by the patient and her physician. It was also deemed advisable to terminate labor with sterilization. The patient was prepared in the usual manner and the abdominal surface anesthetized by novocaine one-half per cent, with adrenalin one to one thousand. The incision through the abdominal wall produced no distress. The uterus was not turned out of the abdomen, but the tissues were held tightly to the side of the uterus to prevent the leakage of its contents. The incision through the uterine wall was painless. The child was removed without difficulty and the uterus emptied of its contents. When the uterus was slightly rotated to bring the broad ligaments into easy access, considerable pain was felt and it was necessary to infiltrate the ligaments separately. Both Fallopian tubes were completely dissected out, beginning at the uterine end and excising that portion of the uterine wall through which the tube passed. The two layers of the broad ligament were brought together by continuous catgut suture. Little difficulty was experienced in closing the abdominal wall. The patient complained more of nervousness and impatience to have the operation over than of pain. To forestall the drop in blood-pressure which always accompanies

the emptying of the uterus, while the operation was done the arm was infiltrated and normal salt solution was given in a vein. The patient's recovery was complicated by the removal of a badly decayed tooth, which relieved her greatly; otherwise her recovery was without incident. The operation had been preceded by a hypodermic injection of morphine and atropine, and during operation the patient received strychnia, digitalin and atropine in one dose hypodermically. The after-care consisted in the hypodermic use of strychnia, digitalin, and codeine given together. Glucose and sodium bicarbonate, each five per cent, were given by bowel; morphine and atropine were used for positive pain or distress. Liquid food, but no milk, was administered. Some prefer to use morphine and scopolamine instead of morphine and atropine. When this is done the patient's ears are plugged with cotton, the eyes are bandaged, and an effort is made to render her insensible to sight, sound, and feeling.

In cases of aortic and mitral stenotic disease, the question of sterilization is sometimes difficult to solve. If the patient has no child and is comparatively young and in good circumstances and surroundings, an effort should be made to prolong the pregnancy, certainly to viability. To accomplish this, a thorough study of the individual must be made and strict rules of hygiene enforced. Tendencies to gout, constipation, toxemia, anemia, and nervous excitability must be guarded against. Gentle exercise in the open air by walking is indicated in all weather, except severe storms. A plentiful supply of fresh air in the sleeping room is imperative. From one to three hours rest midday should be taken, and the patient should avoid crowded and overheated rooms. The patient should be suitably clothed in cold or hot weather and should lead a quiet, regular, but essentially cheerful life. She should be encouraged to believe that she will go to term. Sudden and great changes of temperature are to be avoided and also care and responsibility. By these means pregnancy can often be

carried on to beyond viability, or even to full term. If, at any time, symptoms of decompensation occur and become pronounced, pregnancy must be terminated as soon as possible.

In estimating the gravity of symptoms of decompensation, the tendency to congestion accompanying pregnancy in all patients must not be forgotten. Furthermore, the extraordinary improvement which often follows rest in bed must not be neglected. When, therefore, symptoms of decomposition appear, the mistake must not be made to terminate pregnancy immediately without first giving a trial of physiological rest. The patient should be kept in bed throughout the entire day and night, the food should be of the simplest and most digestible, the functions of digestion should be regulated in the least disturbing manner, and in addition she should be assured that she can be promptly relieved of her distress and that the case will terminate favorably both for the child and for herself.

While the patient is in bed and under observation, the opportunity should be utilized to study thoroughly her processes of excretion. The urine and blood urea should be studied and a record kept of the blood-pressure with the patient at rest. If the symptoms which appear are threatening, digitalis and belladonna may be given in moderate doses. If the patient be sleepless, it must be remembered that in these cases by improving the action of the heart the patient will often be enabled to sleep. If sedatives are necessary, care should be taken not to give those which are depressing, but some form of opium is usually best.

When, in spite of such precautions, the patient does not improve, but symptoms become, if anything, more threatening, pregnancy should be terminated.

Every effort should be made to secure permission for a radical operation, including sterilization. If this is persistently denied and the decision is made to induce labor and terminate pregnancy by vaginal

delivery, the choice of a method of inducing labor becomes of considerable importance.

The cardinal factor in the management of these cases in labor is to prevent pain and mental and physical distress; hence a method of inducing labor which causes great suffering and will seriously disturb a patient should not be selected.

While considerable attention has been devoted of late to the induction of labor by the administration of quinine, castor oil, and pituitrin, this method is too uncertain and too disturbing to be employed where heart disease complicates pregnancy. The use of dilating bags is also contraindicated, because their pressure frequently causes severe pain. The best method is to dilate the cervix moderately under analgesia by morphine and atropine or temporary anesthesia by nitrous oxide and oxygen, separate the membranes so far as possible from the wall of the uterus, and then insert into the lower uterine segment a rectal tube or soft-rubber tube prepared for the purpose. So soon as nagging pains begin, the patient should have a hypodermic injection of morphine and atropine; usually one-sixth grain of morphine and one-one-hundred-and-fiftieth grain of atropine is sufficient. The physician should remain in the house or hospital with the patient so soon as the morphine is given. In some cases the cervix relaxes quickly and the expulsion of the child may occur rapidly and unexpectedly.

If such is not the case, labor must not be allowed to delay. If the cervix is soft, so soon as three-fourths dilatation is present the membranes should be ruptured and active labor encouraged. It is well to avoid the use of ergot and pituitrin for this purpose with these patients. Both increase pulse tension and would add to the burden of the overlaid heart. Strychnia, hypodermically, is an excellent tonic under these conditions.

The effect of anesthetics with heart patients in labor can scarcely be appreciated by one who has not observed it. Ether in small quantities is a better stimulus to labor

under these circumstances than would be ergot or pituitrin. If such inhalation does not materially aid matters, and assist in bringing about prompt expulsion of the child, then the patient should be anesthetized with ether and oxygen and delivery effected by forceps or version. It has long been considered advisable to allow such a patient to lose a moderate quantity of blood at labor. The theory upon which this is based is the relief of the overburdened heart by lessening the quantity of the circulating fluid. Should the patient be toxic, a removal of blood from her body will also lessen her toxemia. Whether this theory be correct or not, patients seem better if a moderate discharge of blood occurs at the time of labor. Should the condition be threatening and assistance and appliances are available, there can be no objection to bleeding followed by intravenous administration of saline solution.

If a physician is called to a patient in labor in an emergency and finds her asphyxiated, struggling for breath, apparently in danger of death and begging for relief, and the question of hospital care is beyond consideration, what is the first duty of the physician? Fortunately in this case the thing which is best to do is that which can readily be done and which will give the patient relief. The first impulse might be to give a stimulant, but experience shows that a medicine which soothes the nervous system is of prime importance. Morphine and atropine, hypodermically, can be given at once and will affect the patient in from ten to twenty minutes. No examination should be made until the patient is wholly or partly relieved of her immediate distress. If she then be examined and the cervix is found soft and half or two-thirds dilated, the membranes unruptured, the amniotic liquid should be allowed to escape by rupturing the membranes, the patient placed completely under the influence of ether and oxygen, and delivery effected in the most prompt and least injurious method possible.

At the moment of labor, or immediately

after, the patient is threatened with danger of pulmonary embolism. Frequently nothing can be done to prevent this serious complication or escape its consequences. Prompt stimulation by the hypodermic use of strychnia, some form of digitalis and atropine, the application of heat over the heart, inverting the body, bandaging the limbs, artificial respiration, inhalation of oxygen, the use of an electric current, if available, all should be employed as promptly and vigorously as possible. The mortality of this complication reaches almost 100 per cent. The signs and symptoms are sudden failure of respiration, the heart often continuing to beat. If efforts are promptly made to reestablish breathing and sustain the action of the heart, a few of these patients recover from the attack. The suddenness of the attack and its tragic termination combine to make this one of the most serious and dramatic emergencies of obstetric practice.

The after-treatment of these cases must be decided upon the individual merits of each case. If the mother has an abundant supply of milk, the breasts without irritation, and if she is interested in nursing the child, she may be permitted so to do. If, however, the breasts fill with difficulty and there is considerable irritation about the nipples when the child nurses, it is better for the mother not to attempt to feed the infant. During convalescence, cardiac stimuli are often necessary and the physician should be careful to ascertain that his patient is not anemic.

The prognosis in these cases depends upon the extent and severity of the heart lesion, the condition of the excretory and respiratory organs, the morale of the patient, and the question of prompt and skilful management. Surprisingly good results are obtained in the most unpromising cases if the physician can keep in mind the cardinal points in the management of these patients. At the risk of wearying the reader, we repeat that it is of prime importance that mental and physical distress be controlled and prevented. Nothing

brings on cardiac syncope so rapidly as the struggles of a woman in labor knowing that she has a serious heart condition and believing herself to be in imminent danger of death. Analgesics and anesthetics are of primary importance in the management of these cases. Second in importance is prompt delivery, with or without labor. The strain of labor is to be avoided. The judicious use of rest and heart tonics is also of value.

It is impossible to state accurately in figures the mortality of heart lesions complicating pregnancy and parturition. So much depends upon so many factors present in each case. Our study of the subject can be in no way complete unless consideration is given to the claims of the child. The mother may ask whether her child will be born with a congenital heart lesion. This question is often raised by patients suffering from ill health of any sort which is prolonged and serious during a pregnancy. In replying one must distinguish between congenital and acquired conditions. Whatever is congenital with the mother is much more apt to be transmitted to the child than a condition which is acquired. As few women having serious congenital conditions of the heart pass through pregnancy and parturition, it is very seldom that this can be directly transmitted. On the other hand it is transmitted, for otherwise we should not have to deal with cases of congenital disease of the heart complicating pregnancy. Acquired conditions, the result of previous disease, are obviously not transmitted. It must also be remembered that a patient having a serious cardiac condition during pregnancy must be deficient in general vigor and nutrition, and that her infant will be correspondingly lacking in development and in strength. One may say then that, on the whole, a serious cardiac condition in the mother predisposes to a

lack of vigor and development in the child. This is one of the reasons why in attempting delivery no additional risk should be thrown upon the mother for the sake of the child.

Another factor which militates against the infant is found in the circumstance that if the mother's condition becomes critical during labor, haste may become imperative in her delivery. Outside of hospital, where abdominal section cannot well be undertaken, version is frequently practiced. If this be done hurriedly or unskilfully, the clavicle or humerus of the child is not infrequently broken during the delivery. Fortunately, these injuries do not endanger life and admit of prompt and complete recovery. Other more serious conditions for the child are found in prolapse of the cord, serious depression of the cranium, and inspiration of vaginal blood and mucus, followed by inspiration pneumonia. The mortality and morbidity of the child is increased certainly ten per cent by the presence of serious heart lesions in the mother.

In discussing the question of cardiac disease complicating pregnancy and labor, one must not forget that disease of the thyroid gland may induce abnormal conditions of the circulation, while not directly causing structural disease of the heart. The rapid pulse of exophthalmos and the abnormal circulation seen in goitre are examples of the condition. During pregnancy the administration of thyroid extract is indicated in many of these cases. They bear the strain of labor as poorly as do those patients having serious cardiac lesions. They require not only narcotics, but also those remedies which restore vasomotor tone and steady the circulation, such as strychnia, belladonna, digitalis, and opium. In skilful hands, anesthesia and delivery without labor are best adapted for these patients.



Editorial

THE EFFICIENCY OF DEEP INJECTIONS OF MERCURIAL PREPARATIONS IN SYPHILIS.

For many years intramuscular or deep subcutaneous injections of various mercurial preparations have been largely employed in the treatment of syphilis, and although the introduction of arsphenamine has to some extent diminished the employment of this plan of treatment, without doubt it is still deservedly popular because of the secrecy with which it can be carried out and also because of its efficiency in certain stages of the disease when mercury is recognized as being more valuable than arsphenamine.

The number of mercurial preparations which have been introduced for this purpose is very large, but experience has finally limited the number to a comparatively short list in which the preparations may be divided into the soluble and insoluble salts. Of the soluble salts, bichloride of mercury and the red iodide of mercury are the ones which are commonly referred to. The bichloride is of course precipitated in the tissues in the presence of albumin, but it is well known that this precipitation does not greatly delay the absorption of the drug, and aside from the discomfort of the injection there is no question of its efficiency.

The insoluble preparations that are most commonly employed are mercury salicylate, calomel, and gray oil, and during the last decade the first of these has continually increased in popularity while the other two have constantly lost ground. With all of them there is a constant danger of mild or severe mercurial poisoning, since their injection in different persons results in varying periods of absorption, and it would also seem probable that there is a marked difference in the

rapidity of absorption according to the portion of the body into which the injection is made, it being absorbed from the gluteal region much more rapidly than from the broad of the back. Much depends, of course, upon the vehicle which is used to carry the mercury into the tissues. We believe that petrolatum should never be so employed, as it does not lend itself to absorption and may result in the development of small tumors, which are increased in size by fibrous tissue which is deposited around the injected material. It is much better to employ a suspension of one of the insoluble preparations of mercury in lanolin, or better still in goose grease, since the latter is more readily absorbed than lanolin, melts at a lower temperature, and for this reason is more easily manipulated when it comes to drawing the emulsion or suspension into the needle and syringe.

It goes without saying that the efficiency of any form of treatment depends upon the effective absorption of the medicinal agent, and to inject it with liquid petrolatum is practically to imprison it.

There are other points in connection with this matter which must not be forgotten. When mercurials are administered by the mouth, there is comparatively little danger of after-effect, because symptoms of mercurialism develop gradually in most cases and digestive disturbance or diarrhea helps the patient get rid of some of the drug before it gains access to the general system. When given by the needle, however, absorption is uncertain. If the part which receives the injection is subjected to massage, or if its circulation is increased by exercises whereby the mercury is more rapidly picked up, the drug may promptly produce some manifestations of its action. On the other hand there may be a distinct cumulative effect so that an outbreak of mercurialism suddenly develops and becomes severe even if the physician and the

patient have been watching for symptoms and have stopped further dosage. Although watching is a wise procedure, it nevertheless does not meet the exigencies of the case because the number of injections already given act as storehouses from which continued absorption is bound to occur. The very uncertainty as to the activity of absorption when the syphilitic manifestations are acute is also an argument which can be brought against the injection method of treatment.

Within the last few months, as some of our readers are aware, Cole, Littmann and Sollmann have attempted to investigate this matter by the use of the x -rays. In the case of the soluble preparations of mercury they got few results, because these failed to cast any shadow which the x -ray would reveal, which in a sense is evidence that such preparations are promptly absorbed. In the case of mercury salicylate, using from 1 to $1\frac{1}{2}$ grains in the buttocks, they found that the shadow induced when this drug was dissolved in anhydrous lanolin disappeared in from three to ten days, and they believe that the average for most patients is about four days. When the injection was made in the lumbar muscles, they think that the average time of absorption is seven days, but the extremes vary from two to twenty-four days. In the case of calomel injected into the buttocks, the absorption occurred much more slowly, the average being fifteen days and the extremes from four to thirty-nine days.

When they came to employ gray oil, using doses from $\frac{1}{8}$ to $\frac{1}{6}$ Cc. of a 40-per-cent suspension, they found that the delay was even greater than in the case of calomel, the average being 43 days with extremes of 16 to 125 days, and they therefore urge that gray oil be dismissed from the list of drugs which are administered in this manner in the treatment of syphilis.

For reasons that we have already given, patients receiving any of the mercurials by means of the needle should be watched

with even greater care than are those patients who are receiving mercurial treatment by the mouth, or by inunction. It is also evident, because of the discomfort and pain which deep injections often induce, that none of these preparations are to be resorted to unless peculiar conditions exist from the social standpoint, or because of the virulence of the disease, or the presence of some lesion involving vital function, so that all question of local discomfort becomes unimportant as compared with the main object which the physician has in view.

THE TREATMENT OF ASCITES BY DRAINAGE.

Clinicians of large experience have undoubtedly met with an occasional case of ascites in which after repeated tappings a fluid fails to recur, probably because the collateral circulation has been established or as the result of inflammatory processes induced by the frequent performance of paracentesis. It has been the custom of some of us, when frequent tappings have been required, to use a large trocar, which when withdrawn leaves an opening of sufficient size to permit the patient to drain slowly into dressings, and under these circumstances it has not been our custom to abstract all the liquid during the operation, but to take away that amount which would relieve tension and let the rest of it escape gradually. In many instances this is not accomplished, because the opening becomes occluded, but this method is advantageous when slow drainage results, because it avoids the sudden relief of all pressure, which sudden relief probably predisposes to another outpouring of fluid.

In the *British Medical Journal*, O'Connor, in charge of the British Hospital at Buenos Aires, has reported two cases of ascites in which the measures used were somewhat similar to these, except that after he had drawn off a considerable amount of fluid he introduced a soft-rubber catheter

through the cannula and then withdraw the cannula, leaving the soft-rubber catheter *in situ*, making it fast externally by silk-worm-gut suture extending from the tube to the adjacent skin.

The first case was one of hepatic cirrhosis, suffering much distress, and from which six liters were drawn off. He rapidly filled up again, and seven liters were drawn off. A week later he was tapped a third time, and six liters of fluid were taken away, and it was on this occasion that the soft-rubber catheter was used. The results were most advantageous in that not only did the patient rapidly become comfortable, but two months later returned to report himself as extraordinarily well, and a year later he remained in good condition.

In the other case the ascites arose from cardiac incompetence; the distention of the abdomen was enormous and associated with slight edema of the lower extremities. At the first tapping eight liters of fluid were removed; three weeks afterward six liters were removed, but only ten days later he came in in as bad a shape as before. The same method was employed in this case as in the first. The flow ceased on the sixth day and there was, as in the first case, a sudden increase in the daily quantity of urine. Two months later, having left the hospital without permission, he reported that he was hard at work, but a short time afterward the cardiac failure became intense and death ensued, but without a trace of the return of ascites.

A POINT OR TWO IN REGARD TO APPENDICITIS.

We think there can be no question at the present time that as soon as the diagnosis of appendicitis is made, and every effort should be used to make it early, there is just one thing to do, provided a competent surgeon is obtainable, and that is to operate. It is, of course, true that a great many people not only pass through one attack of

appendicitis with safety, but that many pass through multiple attacks. Nevertheless, the hope of recovery without operation is a very uncertain one, and quick subsidence of symptoms, instead of being a good sign, is, in the vast majority of instances, an evil sign, in that it indicates gangrene of the appendix. The difficulty in postponing operation is that even if the disease has been in existence but a few hours it is impossible to tell how near gangrene or perforation the appendix is, and if the operation is done immediately by some one who is competent to do it, it has a mortality which is almost nothing; whereas non-operative treatment has a high mortality. A surgical procedure therefore is undoubtedly the thing. Such surgical procedures should not be preceded by active medication in the way of purgatives: first, because the cecum is practically never filled with feces, and secondly, because an active purgative may hurry perforation. Furthermore, surgeons are coming more and more to the view that purgation within twenty-four hours of operation is, as a rule, disadvantageous, and many of them let the bowels be at rest, except for an enema, for forty-eight hours before surgical interference when such delay in other abdominal conditions is permissible.

There is, however, another class of cases of appendicitis in which there is some difference of opinion as to what should be done; namely, those in which the disease has progressed to such an extent that a more or less generalized peritonitis has been developed, in which case no less an authority than Ochsner (*THERAPEUTIC GAZETTE*, February, 1921) believes that the patient should be let alone from the surgical standpoint, should be put in an exaggerated Fowler's position, and should have saline by the Murphy drip method until the acute inflammatory process has had an opportunity to subside and nature has been able to throw out protective barriers, thereby limiting the progress of the disease. Similar views are expressed by Deaver in an article which appears in

the current issue of this journal. If death results in such cases the responsibility for it is to be placed upon the failure to operate early and not upon the method of treatment which is instituted, since the mortality when such cases are operated upon in the presence of a general peritonitis is greater than the mortality when the patient is put in the Fowler position and receives the Murphy drip.

We are well aware that some surgeons do not agree with this view, but Deaver and other prominent operators believe that it is a wise procedure, and that in this case withholding the knife is to be as much commended as is the early use of the knife in the first type of cases to which we have referred. In the latter type of case it may be said that in all probability there is no better method of treatment than that which was devised by Ochsner. (See February issue.)

SOME ADDITIONAL MEASURES AGAINST DIPHTHERIA.

Within the last few months three interesting papers bearing on this subject have appeared—two of them by Geilen, Moss and Guthrie, in the *Johns Hopkins Hospital Bulletin*, and a third by Fraser and Duncan in the *London Lancet*.

The object of the first named investigators, as stated in their first communication, was to determine the effect of diphtheria antitoxin in preventing lodgment and growth of diphtheria bacilli in the nasal passages of animals. As a result of their work they conclude that the subcutaneous administration of antitoxin does not prevent the lodgment and growth of this pathogenic organism in the nasal passages of cats, guinea-pigs, and rabbits. While it is recognized that the conditions in these animals may not be identical with those which exist in children, nevertheless the results which they obtained are of interest and importance as indicating that while antitoxin is of immense value when the disease has once developed, it does not

seem to be a factor which we can employ in the treatment of so-called "carriers."

In their second paper they studied in children the following points: namely, the persistence of the bacillus in the throats of persons having positive cultures but not suffering from clinical diphtheria, the virulence or non-virulence of the diphtheria bacillus in the throats of such persons and whether such bacilli may undergo a change in virulence, or, in other words, whether they may become avirulent on the one hand or, if they are avirulent primarily, acquire virulence while growing in the throat of the carrier.

They also made investigations as to whether any of the carriers examined had at any previous time had clinical diphtheria or had been exposed to the disease. The number of children examined was over 800; 426 being males and 374 females. In February they found that the diphtheria bacillus was present in 85 cases, or 10.62 per cent. Three months later they got 69 positive cultures or 8.62 per cent. The incidence of positive cultures was practically the same among males and females in the different age and sex groups.

The paper which they have contributed is a most exhaustive one, with many tables, and they conclude that the diphtheria bacilli present in the majority of healthy carriers belong to the avirulent type, a type which cannot produce diphtheria. Furthermore, they have been unable to adduce any proof that avirulent diphtheria bacilli can acquire virulence, or to express it differently, carriers of such bacilli do not constitute a menace, and interference with the liberties of these persons on the ground of their being carriers is unwarranted and not justifiable. While fully appreciating the fact that the guinea-pig test may be taken as a safe index of virulence or non-virulence, they recognize the loss of time and expense entailed in the application of this test, but believe that it is far less difficult to carry out than the quarantining of all persons whether they are carriers of avirulent or virulent germs.

They also express the interesting opinion that while the carrier of virulent bacilli occupies a very different position from that of the carrier of the avirulent type, nevertheless the danger from the former has been overestimated. These results, of course, in no way justify the cancellation of rules already in existence in regard to quarantine, nor do they negative the necessity of applying measures which may change a carrier of virulent organisms into a safe person.

The third paper to which we refer, namely, that by Fraser and Duncan, discusses the treatment of diphtheria carriers with detoxicated Klebs-Loeffler vaccine. As a result of their work they believe that by the use of such a vaccine we have a method of promising efficiency in dealing with contacts, convalescents, and carriers. They point out that antitoxin protects only from the toxin produced by the living diphtheria organism, but assert that the vaccine prevents the growth and life of the organism, and, therefore, they urge that in case of diphtheria both vaccine and antitoxin should be given. They claim that such a combination will produce a good effect and that there is usually no trace of a chill or local reaction.

The dose of detoxicated diphtheria vaccine employed by them varied over wide bounds. Thus a girl, aged twelve, who was held responsible for three consecutive outbreaks, was treated by the subcutaneous injection of doses which began with 100 million, and were increased gradually during a period of two months until they rose to 3200 million. In the case of a soldier twenty-six years of age, the doses began with 4 million and increased to 350 million; the vaccine being supplied from the laboratory (to use the words of the reporters) in the strength of 2000, 20,000, and eventually 100,000 millions per Cc.

So far as we know this combined method of treatment by vaccine and serum has not as yet been arranged for so that the general practitioner can obtain both products on the market, but we have called attention to

these researches because they seem to point to additional means by which the great problem of "carriers" can be attacked. The problem of protection by the use of toxin-antitoxin, and cure by the employment of antitoxin alone, has been already universally accepted as settled.

DIGITALIS AND DIPHTHERIA.

Although it is true that pharmacological investigations carried out upon animals and men when in health are of infinite value and have done much to place our treatment of disease upon a firm foundation in distinction from the empiricism which was required of our forefathers, it is also true that very little work has been done in regard to determining the exact physiological activity of most potent drugs in the presence of acute illness due to infections or as to their influence upon various organs of the body during convalescence. Indeed, it would begin to appear that in not a few instances during the course of pneumonia, typhoid fever, and diphtheria, some remedies while theoretically indicated are practically not only useless but actually harmful.

The ease with which the electrocardiograph can be used in cases of illness opens up a field which we hope will soon be tilled, and we believe that it is possible by this means to determine in each patient when what might be called a massive dose of a certain drug, as digitalis, is needed, whereas in another case of circulatory failure it would be found to be absolutely contraindicated.

In line with this thought attention may be called to a communication made not long since by McCulloch, who has studied the question of the use of digitalis in post-diphtheric cardiac disorders. He used the electrocardiograph and showed that the diphtheria poison exercised a very definite influence over the conduction of contraction waves in the heart, in some instances producing either a block of one branch of

His' bundle or complete heart block. As is well known, massive doses of digitalis are capable of producing just this condition even in a healthy heart, and therefore the physician who thinks of digitalis solely as a circulatory stimulant, without carefully considering our increased knowledge concerning the physiology of the heart muscle and the influence of digitalis upon it, may, unwittingly it is true, produce grave disaster even by the comparatively moderate use of this powerful drug, which like all powerful drugs is capable of doing so much good when properly used and so much harm if abused.

THE ORTHOPEDIC SURGEON.

The tendency of the time is toward specialism.

The benefits accruing from specialism, not only from the standpoint of the patient, but from that of a greater knowledge and keener interpretation of symptoms, and a refined and more efficient technique, are well recognized, hence the popularity of consultations. The dentist is a shining example of the specialist, who in part, because of his application to a limited field, has acquired a manual dexterity, supplemented by mechanical helps, to an extent little realized by the general surgeon. The ophthalmologist in his special line of research has far outstripped both the practitioner of medicine and the surgeon. His contributions to each of these men, both from the diagnostic and prognostic standpoint, have been of incalculable value. The neuro-surgeon has not been without his value, especially when his work has been supplemented by the knowledge and his hand has been directed by the diagnostic acumen of the neurologist.

Particularly during the war, and led by Jones and Goldthwait, the orthopedist has been clamant for an enlarged field and a wider recognition. In this relation Jones's contribution to the *British Medical Journal* of November 20, 1920, is of particular value. He states that in the past a very

superficial surgical knowledge was required by the orthopedic surgeon. Lateral curvature, flat-feet, knock-knees, and certain congenital deformities mainly sufficed to represent the specialty. A few tenotomies and an occasional osteotomy were all the operations that were practiced. An operative technique was not imperative, and the use of the knife was a last resort and generally represented the failure of mechanical effort.

Such a narrow definition of orthopedic surgery as sufficed then cannot be allowed to obtain to-day, and for this reason we should agree as to the limits of its expansion. Jones ventures to suggest the group of cases which a modern orthopedic surgeon should be prepared to treat. They should consist of:

Fractures—recent, malunited, and ununited.

Congenital and acquired deformities of the extremities.

Paralyses of the extremities.

Diseases, derangements, and disabilities of the joints, including the spine, wry-neck, and those conditions included under the general term "bone-setting."

This definition covers a very large area of surgery, and therefore will appeal to the ambition of the best type of young surgeon. An orthopedic surgeon must primarily have a thorough working knowledge of general surgery, and all through his life he must be cognizant of its advances.

Function is his goal, and he should know and be able to practice the best way of arriving there. He must have a sense of perspective and of proportion. An operation means to him but the beginning of his problem. His most brilliant operative exploit, unless directed to a functional success, should be a reproach. This can only be achieved by acquiring, in addition to mechanical knowledge, an operative skill of the highest kind.

The surgeon may very properly urge that if so large a group of cases were taken from his wards much valuable teaching

material would be lost to him. The answer to this is that the general surgeon should have an absolute right to treat any case and as many of any type of cases as he desires. The orthopedic surgeon is alone to be limited as to type. He should only be allowed to treat cases which are included in the definition. The general surgeon should not be limited by any definition of any sort. Under such an understanding there would be no resentment and no reservation. Take fractures as an example. The treatment carried on in the orthopedic ward would be contrasted in friendly rivalry with that of the surgeon who takes such cases into the general ward. If the orthopedic surgeon falls short of expectation, the rivalry will be to his disadvantage. Truth never shows better than when contrasted with error, and in the nature of events fractures will be absent from such an orthopedic ward. If he should succeed, the reverse condition will occur, and the general surgeon will be only too delighted to be rid of a case in the treatment of which he does not excel. In any case the rivalry will benefit them both—and, incidentally, the patient.

A great defect in our large general hospitals is the system whereby a surgeon is expected to treat equally well cases in regard to which he is an acknowledged master, and cases which do not interest him in the least. There is an urgent call to remedy this dangerous defect. Once a surgeon is convinced by demonstration of his inability to give the best to a patient, he would no longer care to invite comparison. A surgeon of international reputation on the brain is only too pleased to hand over a case of hemorrhoids and accept a tumor of the pituitary. A well-organized orthopedic department should prove a pleasant dumping ground to many a skilful and conscientious surgeon.

Orthopedic surgeons should convince hospital authorities of the urgent necessity of open-air annexes for the active treatment of crippled children.

It will be agreed that the student is more

receptive of orthopedic training toward the end of his curriculum than earlier. The essential point, however, is that his attendance should be compulsory for a certain number of sessions. It should be possible that on one day a week the orthopedic department be prepared to lay itself out for systematic instruction, and the student should be obliged to attend upon at least twenty occasions. During that period every variety of case should be demonstrated, and opportunities should be afforded him to do practical work. More especially should he be taught the principles that underlie the prevention of deformities and their correction. At this clinic the instruction should be of the simplest kind, and the student should not be burdened by material of a controversial character. He should not leave this clinic until he has mastered the simpler and most efficient methods of treating fractures. He should also be made familiar with the uses of plaster of Paris. This course of education should be carefully planned, and week-end visits should be made to the country hospital.

Postgraduate teaching has hitherto been unsatisfactory. Practitioners have come for, at most, a month or six weeks, and the arrangements, on the side of both teacher and student, have been of a most casual kind. The glamor of the operating theater has overshadowed the out-patient department, from which the bulk of his training should come.

Systematic instruction should be offered the postgraduate, and should consist of short courses for the practitioner who merely wants to be familiar with modern methods. Even this tuition should be carefully planned so that the education may prove intensive. The postgraduate who can only spare three months should be encouraged, for he is the type of man who feels the responsibility of not being competent. The postgraduate school should, however, be prepared with higher courses of training as applied to men who wish to become thoroughly efficient orthopedic surgeons.

These courses should extend some over one and others over two years, and graduates should be given every opportunity to familiarize themselves by practice both with mechanical and operative technique. At the end of the first year, if the work of the graduate has been satisfactory, he should be granted a diploma in orthopedic surgery, and if he elects to train a second year he may take his university degree in the same subject. The higher courses should offer the advantages of the anatomical, the physiological, and the pathological departments, and for a degree original research work should be essential.

These suggestions are so entirely rational, and their application is so essential to the proper handling of many cases which because of lack of knowledge upon the part of practitioners of both medicine and surgery have remained permanently crippled, that there is little doubt but that they will be put into effect; it is to be hoped promptly.

A major difficulty is incident to the circumstance that the number of men thoroughly trained in the treatment of affections which Jones classes as orthopedic is comparatively few, and to the further fact that the men who are not so trained recognize neither the need of such training nor the inadequacy of their present results.

VENEREAL DISEASE PROPHYLAXIS.

The unofficial National Birth Rate Commission has appointed a special committee to inquire into certain aspects of venereal disease, says the *British Medical Journal* of November 20, 1920. The terms of reference are to consider the following questions:

1. Whether sexual continence before marriage is consistent with normal health.

2. Whether self-disinfection as a method of preventing the development of venereal disease in persons who have exposed themselves to the risk of infection is more efficient or less efficient than medical treatment at venereal clinics and early treatment centers.

3. The possible advantages and disadvantages of various suggested methods of self-disinfection, (a) before, (b) after sexual intercourse.

4. Whether methods of self-disinfection involve any serious disadvantages of a moral kind—that is to say, whether they are calculated to weaken moral control, and thereby to lead to an increase in promiscuous sexual intercourse; and if so, to what extent these disadvantages should render the use and advocacy of self-disinfection undesirable when considered from the point of view of ultimate national welfare.

There has been a strong feeling not only in England, but in this country, to the effect that the so-called venereal prophylaxis—i.e., the application of washes and antiseptics to a person immediately after exposure and before the development of symptoms—is an encouragement to immorality and therefore should not be countenanced. Such has not been found to be the case. Moreover a person who has had a sexual contact without the law should be looked upon in the same light as a diphtheria contact. In place of waiting for the possible development of disease, he should at once be given, or take, a treatment which gives a reasonable assurance against infection in his or her person. This policy is supported by the Pennsylvania Department of Health, and if it proves efficacious will undoubtedly become a world-wide policy in a comparatively brief time.



Progress in Therapeutics

Medical Therapeutics

Gastric Dilatation in Pneumonia in Children.

KERR, in the *New York State Journal of Medicine* for November, 1920, states that the objective findings in this condition are characteristic. Inspection often reveals a visible and palpable tumor in the upper abdomen, although not always in the normal stomach position because the organ may be displaced. Immediately after vomiting this may be reduced. While the whole abdomen may be enlarged and tympanitic, the upper portion is more prominently so. If the distention is great or the abdominal walls thick, the stomach may not be readily outlined. Percussion findings will depend upon whether the contents of the stomach are gaseous or fluid.

Usually after a few hours the pinched features and the objective evidence of circulatory shock are marked. The pneumonia continues its usual course for several days, when rather suddenly the symptoms just described become more or less prominent, causing much anxiety to all concerned. Or they may become immediately alarming, with all methods of treatment and medication proving of no avail. And the child dies. From discussion with a large number of fellow-workers, he knows that the symptoms caused by acute gastric dilatation are not laid to that condition, but are supposed to be due to cardiac failure, dilatation not having been suspected. This explains in part the failure of cardiac stimulants: they are misapplied. Perhaps the recital of a recent case will better illustrate this.

While attending a clinical meeting it was reported to him that one of the children in the pneumonia ward was dying. This was at 8:30, and his examination revealed that the respiration had quite suddenly risen from 61 to 90 per minute, although the tem-

perature remained stationary. The child was markedly cyanotic and uncontrollably restless. There had been one sharp attack of vomiting earlier. The whole abdomen was enlarged, but more so in its upper portion. The stomach was immediately washed out and orders left that nothing be allowed by the mouth for at least twelve hours. No medication was given, although it is his usual practice to administer a small amount of morphine by hypodermic. He wished to impress the interne with what could be accomplished by lavage alone to meet what he termed "cardiac failure." Immediately following the lavage the child became quiet, fell asleep in ten minutes, and one hour later when the respirations were taken, they were down to 41. When he saw the child again at 11 (two and a half hours after the examination which revealed the acute dilatation) the child was still asleep, quiet, and without the slightest evidence of cyanosis.

No doubt the lavage by its prompt removal of material which could not be acted upon because of the loss of motility of the stomach helps to reduce the shock. He is convinced that if the lavage had not been done or its performance had been delayed for a few hours this child would have died and the death would have been attributed to cardiac failure.

Treatment must be prompt and adapted to the immediate condition of the stomach. If percussion reveals much fluid the foot of the bed should be elevated from 12 to 18 inches and the left anterolateral abdominal position assumed. The head may overhang the edge of the bed and the left arm be allowed to hang or rest upon a chair, while the back is supported by pillows from neck to heels.

The next essential is efficient lavage.

Efficient lavage means first the complete

emptying of the stomach, and this may give the needed relief. If not we must be prepared to follow it up with continuous lavage. This is accomplished by inserting a small tube through the mouth or nares, securing it by adhesive to the cheek. This avoids the repeated introduction of the larger tube.

The next essential is the absolute withholding of everything by mouth for at least twelve hours and often longer. Water, medicine, everything must be absolutely stopped. To limit or prevent a starvation acidosis, it is permissible to administer by proctoclysis a solution of bicarbonate of soda with glucose. For acute dilatation, firm pressure is made for several seconds across the spine in the interspaces between the third and fifth thoracic vertebra. This causes an explosive eructation of gases.

Another procedure which may be desirable, but not absolutely essential, is the administration by hypodermic of small doses of morphine. He has not used eserine or atropine, although they may be of service.

In lobar pneumonia in children we have a definite mortality factor whose importance cannot be appreciated unless the possibility of its occurrence is recognized. He feels now that it is just as important to provide the simple apparatus for lavage as to carry the stethoscope. His examinations are now more directed to the abdomen than the chest; inspection and palpation of the former are much more frequently done than percussion and auscultation of the latter. As this serious accident is more apt to occur just before or at the time of the expected crisis, the occurrence of cyanosis, restlessness, and exhaustion should result in an immediate and complete examination of the abdomen. If this is done he has no doubt that the rarity of cardiac crises will be appreciated; that the symptoms commonly attributed to the heart will find their explanation in acute gastric dilatation; that the failure of all stimulants at the time will be explained, and with the prompt application of the adequate measures to efficiently meet the emergency, some of the children will be spared.

Tobacco Smoke as a Mouth Disinfectant.

Writing editorially on this subject, the *Lancet* of October 30, 1920, says it must be admitted that it would be of great practical interest to ascertain definitely what action tobacco smoke may have on the microorganisms of the mouth. During the recent influenza epidemics every medical practitioner must have been repeatedly asked by his patients whether tobacco smoke can kill the influenza microbe. Several disquisitions exist in medical literature with the object of solving this problem, but all of them fail in not having made any practical experiments on the subject, so that it still remains undecided whether the marked bactericidal power of tobacco, as shown *in vitro* upon many microorganisms, is also manifested in the oral cavity and even, as some have alleged, in the lungs after inhalation and in the intestine following on deglutition.

Puntoni, of the University of Rome, has undertaken some experiments with the object of ascertaining the real action of tobacco smoke as a disinfectant under conditions similar to those which exist in the oral cavity. The results of these experiments are interesting. In the first place it was found that the strikingly disinfectant power that tobacco smoke exercised *in vitro* did not occur to the same extent in the mouth of the smoker; and the most that could be said was that a bactericidal action was only shown to follow the consumption of very large quantities of tobacco, and then only on the microorganisms of least resistance, such as the meningococcus and cholera vibrio. It is not admissible that microbes having the resistance of *B. typhosus* or greater can be killed in the mouth by tobacco smoke, and it is absurd to think that the bactericidal action of the smoke could manifest itself in the respiratory tract as a sequel to inhalation.

The different qualities of tobacco made use of in these experiments showed a disinfecting power almost equal in relation to the weight of tobacco used; denicotinized cigars acted just as powerfully as ordinary

ones. The smoke of tobacco completely decolorized by filtration through compressed cotton-wool retained a marked bactericidal action, notwithstanding the loss of all the nicotine and tar products, which are the two elements possessing definite disinfecting power. The bactericidal substances contained in this decolorized smoke are soluble in water, one of them being capable of distillation at 100° C. and identical with formaldehyde; the other not capable of distillation was pyrrol, the bactericidal action of which as a component of tobacco smoke, and hitherto unknown, is important. The disinfectant action of tobacco smoke is, however, due to the activity of many elements, among which may be enumerated with certainty tar products, nicotine, formaldehyde, and pyrrol.

It may be recalled that, as shown in its own investigations of the subject (*Lancet*, April 6, 1912), the main constituents of tobacco smoke are found to be basic in character, and germicides, generally speaking, are of the acidic type—*e.g.*, salicylic acid, benzoic acid, boric acid, carbolic acid, hypochlorous acid, and so forth. Whether this differentiation has any significance is not clear, but the experiments recorded remind one of the tradition that during great cholera epidemics those who smoked clay pipes proved immune from the disease, though surrounded by numerous cases.

Effect of Carminative Volatile Oils on the Muscular Movements of the Intestine.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1920, PLANT states that the volatile oils are widely used as carminatives, but the manner in which they produce carminative effects is not well understood. If one consults the various text-books on pharmacology it is evident that a difference in opinion exists as to what type of change the volatile oils in therapeutic doses produce in the muscular movements of the alimentary canal. Thus, some authors say that the volatile oils produce relaxation of the

gastric and intestinal musculature and must therefore allow escape or onward progression of gases or contents passively. Others convey the opposite impression and state positively, or as probable, that carminatives increase the muscular movements of the alimentary canal. Muirhead and Gerald found that dilute solutions of volatile oils, *e.g.*, 1:50,000, produced increase in tone and in the amplitude of the rhythmic contractions in isolated pieces of intestine immersed in suitable oxygenated solutions, while stronger solutions, *e.g.*, 1:5000, caused relaxation. Some of the volatile oils they used belong to the carminative group, others do not.

The volatile oils when used as carminatives are mild remedies and must exert their primary effect on the mucous membranes of the alimentary canal; ordinarily the dosage is small and the concentration of the drug as it is applied is relatively low. It seems quite probable that their effects might easily be obscured by experimental conditions; that the results of their application to isolated pieces of intestine where they reach all surfaces in equal concentration, as in Muirhead and Gerald's experiments, or when their action is tested in intact animals where other disturbing factors are present such as anesthesia and operative procedures, may fail to give a true picture of what happens when they are applied to mucous membranes in dilute solution.

These considerations made it seem worth while to investigate the effects of volatile oils on the intestinal movements in experiments where no anesthetic was used, where no operative procedures were necessary at the time of the experiment, and where they could be applied to the mucous membrane in concentrations comparable with those employed therapeutically.

He then summarizes his article as follows:

1. Carminative volatile oils increase the muscular movements in the intestine when applied to the mucous membrane in dilute solution in unanesthetized dogs.

2. This increased activity involves an

augmentation of tone and of rhythmic contractions, and, at least during the increase in tone, progressing contraction rings (peristalsis) occur.

3. Occasionally the primary increase in muscular activity is followed by a decrease in tone and in amplitude of the rhythmic contractions.

4. These effects of the volatile oils are lessened but not abolished by atropine. They are abolished when the sensory endings of the mucosa are paralyzed by cocaine.

5. When the muscular activities of the intestine are markedly increased by the injection of small doses of morphine in dogs, the same kind of effect is produced by the volatile oils as before the morphine was injected.

Preservation of Lemon Juice.

BASSETT-SMITH, in the *Lancet* of November 13, 1920, states as a result of a number of experiments that concentrated lemon juice will keep well in concentrated juice or tablet form.

Boiling the lemon juice for five minutes does not appreciably diminish the anti-scorbutic property.

Heating for three-quarters of an hour at 58° C. diminishes it to a more marked degree. The equivalent of 2.2 Cc. in one animal gave complete protection; 4.4 Cc. completely protected three out of four.

The Relation of Food to Infantile Eczema.

O'KEEFE, in the *Boston Medical and Surgical Journal* of November 11, 1920, states that sensitization in the exclusively breast-fed infant is an interesting feature. Some infants were found sensitized to proteins which they had no history of ever having ingested. One such nursling was sensitized to cow's milk casein. The eczema improved when the milk in the maternal diet was cut down to a pint a day. It was found then that to make up for this diminution in milk in her own diet, the

woman had been taking cheese and cream. These were omitted from the maternal diet, and the child's skin cleared completely in two weeks. This child, five months later, showed a relapse of the eczema when the mother commenced to wean him and use cow's milk in his diet. At this time he showed a negative reaction to casein. Without knowledge of his history it would have been difficult to have determined the cause of his relapse.

Another child whose mother gave a history of eating large amounts of oatmeal showed sensitization to oat and egg proteins. The mother was intelligent and was positive the child had never been given either egg or oat in any form. The mother showed no evidence of sensitization to egg or oat and gave a negative test to both these substances. Elimination of these two articles of food did not result in improvement during the month that this case was under observation. The mother then failed to return. It was learned that the eczema had persisted.

Another nursling of six weeks gave a positive reaction to codfish. The mother's diet was said to contain a large amount of fish. This child's skin cleared up when the cod was omitted from the maternal diet.

Three other exclusively breast-fed infants showed positive reactions; two to egg and one to lactalbumin. One of the two showing a reaction to egg did not clear up until weaned at the age of one year. The other showed steady improvement when the egg was omitted from the mother's diet, and at the end of six weeks was free from eczema. In the nursling sensitized to casein, reduction of the milk in the maternal diet effected some improvement in a month, and at the end of another month cleared up entirely and has remained so for over six months, during which time the mother has limited the milk in her diet.

Such findings suggest that foreign proteins may pass from the mother in her breast milk in sufficient amounts to result in sensitization of the infant. A biologic investigation of breast milk might throw light on this point.

Seven cases of this series showed an excess of fat in the stools. Reduction of the fat to within the individual tolerance resulted in each instance in great improvement in the skin condition. Five of these cases were sensitized to casein, one to egg; one showed no cutaneous response to any of the proteins used. In each case a relapse occurred when the fat was again increased beyond the child's tolerance as shown by stool examination. The improvement following a reduction in the fat occurred without any change in the amount of protein in the diet other than that incident to the cream reduction. In these cases the fat was the predisposing factor rather than the causative factor of the eczema. An excess of fat interfered with the digestive processes or with the integrity of the intestinal walls sufficiently to permit undigested protein molecules to enter the circulation. There is no doubt that unsuitable forms or amounts of carbohydrate in the child's diet act in a like fashion to pave the way for protein inroads.

The 41 per cent of positive reactions occurring in this series of eczemas is in striking contrast to the percentage occurring among normal children, in whom Baker reports the incidence of protein sensitization to be an almost negligible factor.

In considering the results of treatment it is difficult to gauge the part played by external therapy. It is always a great comfort to the patient. In some cases, moreover, it seems to be alone sufficient to effect a cure. Theoretically it cannot be considered more than a palliative measure if we are to believe that the disease is a result of food poisoning. O'Keefe would not care to be deprived of the aid of the dermatologist either in the diagnosis or treatment of the disease.

As an aid to regulation of diet the protein skin tests give information which can be obtained in no other way. These tests do not supplant the older methods of determining what does and what does not agree with a particular infant, but they do supplement such methods. All persistent cases

of eczema should have the benefit of whatever knowledge can be gained of their particular idiosyncrasies by this method. It should not be to the exclusion of a careful dietary history and a complete physical examination with especial attention to the stools. All these data are important, because they enable intelligent management of the child's diet.

The intimate relation shown to exist between food and eczema in so large a percentage of these cases justifies the conclusion that dietary regulation is essential in the treatment of this condition.

Results of Three Years' Treatment of Syphilitic Mothers and Babies.

ADAMS, in the *Lancet* of November 13, 1920, reminds us that two years ago he read a paper before the Obstetrical Section of the Royal Society of Medicine on the Treatment of Ante-natal and Post-natal Syphilis. At that time he was only able to give the results of one year's treatment, and a wish was then expressed that he would report the progress of these cases at some future date. He now publishes a table giving the full results of all cases treated during the past three years at the Thavies Inn Venereal Centre for pregnant women as far as it has been possible to follow them up. He quotes as follows from his former paper:

"I am aware that one year is too short a period in which to bring the treatment of ante-natal and post-natal syphilis to perfection, and that the treatment adopted to-day will be improved to-morrow."

This statement has been fully confirmed during the past two years. He has been able to follow up most of the cases and to show (last November) to the Fellows of the Hunterian Society many of the babies up to two years old, all of whom appeared perfectly healthy and showed a negative Wassermann test. On one occasion only a baby showed a doubtful positive Wassermann reaction after once becoming negative.

In each year the percentage of babies born with a negative Wassermann reaction has increased, as shown by the statistics which he has given. He attributes this result to the more active treatment the mothers receive before confinement, and the more general use of arsphenamine in pregnant syphilitic women than formerly. He looks forward with the greatest confidence in the future to see the wastage of infant life from syphilis almost come to a vanishing point. At present it is doubtful if any disease, even tuberculosis, is so destructive to child life or so disastrous to child health as syphilis. Most of the mothers enter Thavies Inn at about the sixth month of pregnancy, having been sent there on a diagnosis of syphilis, made either on clinical evidence or on the Wassermann test. Some have been treated with mercury and arsenic, and in consequence have no obvious lesions; others have had no treatment whatever. Practically all are in the secondary stage of the disease.

The results of treatment are most encouraging, though, of course, they vary with the period before confinement at which it is begun. In the last two years there has been only one stillbirth and no deaths from syphilis among the cases treated. His experience has been that if the mother's Wassermann test can be brought to negative or doubtful at her confinement the baby will be born negative and show no sign of syphilis. If the mother is positive or strongly positive the baby will probably be positive too, in which case, of course, vigorous antisyphilitic treatment is begun at once. However, in a case at present under his care, in which a definite history was obtainable that infection took place about seven months after conception and no treatment was given before confinement, the baby was born negative, although at the time the mother had generalized syphilis, as shown by a strongly positive Wassermann reaction. Cases of this kind open up questions as to the cause of the baby's immunity.

None of the babies born negative have since become positive, nor developed any signs of syphilis, though many have not had

any treatment beyond the drugs they absorb through their mother's milk.

To summarize, he says that a pregnant woman with syphilis, whether active or latent, if treated for three or four months before her confinement, will probably be delivered of a healthy child at full term.

The Action of Adrenalin on the Heart.

HEINEKAMP, in the *Journal of Pharmacology and Experimental Therapeutics* for November, 1920, sends us these conclusions as a result of studies on dogs:

1. Chloroform is toxic for heart muscle, producing or tending to produce weakening of the organ.

2. Inhibition under chloroform anesthesia after adrenalin is due primarily to the toxic or paralytic dilatation of the heart, ventricular fibrillation supervening on this condition.

3. Because of the action of chloroform on the heart adrenalin is contraindicated wherever chloroform is employed, and chloroform wherever adrenalin is used.

4. The blood-pressure has no definite reflex relation to the production of the condition of paralytic dilatation, but has a most important direct action by preventing the ventricle from emptying itself.

5. The 'adrenalin action is peripheral since it occurs after section of the vagi.

The Pharmacology of Chelidonin, a Neglected Alkaloid of Chelidonium, or Tetterwort.

HANZLIK, in the *Journal of the American Medical Association* of November 13, 1920, in summarizing his article says:

1. Attention is called to the activity and usefulness of chelidonin, a neglected alkaloid, obtained from tetterwort or celandine, which was formerly official in the U. S. Pharmacopœia.

2. The actions of chelidonin resemble those of papaverine and the benzyl esters, but differ from morphine in several particulars. It possesses a relatively low toxicity.

3. Chelidonium causes depression and narcosis without subsequent excitation of the central nervous system, differing in this respect from morphine. It slows the pulse, and lowers the blood-pressure, owing to cardiac depression, relaxes smooth muscle in all regions, and depresses skeletal muscle without influencing the nervous connections.

4. Therapeutically, chelidonium is indicated in hypertonus, angina pectoris, bronchial asthma, intestinal, ureteral and uterine colic, or spasm of smooth muscle anywhere.

5. Being obtained from a weed growing extensively in the United States, and which can also be easily cultivated, chelidonium offers a distinct economic advantage over papaverine, which at present is virtually unobtainable. It is also more palatable than the benzyl esters.

An Analysis of the End Results of Treated Chronic Septic Myositis, Neuritis, and Arthritis.

JONES, in *Northwest Medicine* for November, 1920, states that in the treatment of all his cases the principles have been divided into, first, the radical removal of all foci of infection, and second, the subsidiary measures. Some of his complete failures have been associated with the refusal on the part of the patient to permit the removal of some or all of such foci. It is, of course, problematical what influence this has had in these failures.

The statement made by Lilly and Lyons in their statistical report of 200 cases of arthritis and myositis, that improvement is assured in 79 per cent of all by tonsillectomy alone, may hold in the myositis group, but he does not expect it to hold true in arthritis cases. Many of his results came only after carrying out the subsidiary measures of treatment over a long time. The greatest criticism of Lilly and Lyons' report is the time factor of one year. Many arthritis cases are known to relapse severely after periods of one, two, or more years. Pemberton reports that in his series of 400 cases, 184, or 46 per cent, recovered in the presence of demonstrable surgical foci; but

here again the time factor is too short, it being but nine months.

The subsidiary measures of treatment which he has employed in his cases to a greater or less degree are: (1) Mechanical and hydrotherapeutic, (2) autogenous vaccines, (3) stock vaccines, (4) foreign proteins, (5) radium, (6) dietetic, and (7) climatic.

Massage, baking, etc., were used more or less in most of the patients. Autogenous vaccines gave rather uniformly better results than did stock vaccines. With a number of patients suffering from a severe grade of arthritis, in whom more or less progressive results were being obtained, resort to a stock vaccine had to be made by reason of exhausting the original supply, and uniformly less good results were noted from its use. This stock vaccine was prepared by combining eight or ten strains from the arthritis cases then being studied and known to produce specific lesions in animals. It was also noted many times that subculturing destroyed whatever specificity the organism may have had originally for the individual patient. These things recurring as they did made him believe that there was probably more than a non-specific protein reaction to the autogenous vaccine, and he finally prevented the above mentioned possible happenings by preparing a large amount of vaccine at once from the original animal cultures. All in all he thinks he obtained better results from the autogenous vaccines than he did from all the other measures combined, although that is difficult to say, because most of these patients had some of the other measures applied alternately or at the same time.

Typhoid proteins were used with much less benefit than the vaccines. They were started in small doses—5 or 10 million—according to the physical state of the patient, the presence of marked asthenia, anemia, etc., and no doses larger than 60 million were given. He cites one case which was a most instructive study, in that it showed clearly that the use of a typhoid protein is not free from danger. The patient, a gaunt-built man of twenty-nine

years, had been profoundly sick and crippled with a progressing deforming arthritis for eleven months. Tonsil cultures gave a pure culture of a non-hemolytic streptococcus which was negative to animals. The severe dental sepsis gave in pure culture a hemolytic streptococcus viridans which produced in several rabbits lesions of the peritoneum, pleuræ, lungs, and lymph glands, from which the organism was again obtained. No lesions of the joints or muscles were produced. While awaiting the making of a vaccine, the patient was given three injections of 5, 10 and 15 million typhoid protein, respectively, at intervals of five and seven days. During the period of the last reaction he developed a confluent bronchopneumonia, from which he died. Autopsy gave a hemolytic streptococcus viridans from the lungs, pleuræ, and peritoneal fluid. The patient also had scattered syphilitic lesions of the heart, aorta, liver, and pia-arachnoid. Blood Wassermanns had been negative during life. In the few syphilitic and alcoholic arthritic patients treated he obtained no results.

Radium was used intravenously in a few cases. In two it afforded the most relief of anything employed, but by no means anything like complete relief. The metabolic work of Pemberton was not carried out with any of the patients of this series. He has two arthritics now under observation, and is watching these with much interest. One is a very severe multiple deforming case, upon whom much work has been done during the past few years without any results, and the other is a well-nourished woman with a moderate grade of inflammation limited to the right knee, who was free from pain and swelling for a week or two after tonsillectomy and then relapsed as badly as ever. (A foot-note states that these two patients later showed no effect upon their arthritis from low protein diets.) The arthritic conditions in several general asthenic patients were notably benefited by forced feeding and the general reconstructive principles underlying such work. One patient in the series received her final relief from a short residence near the Imperial

Valley in Southern California. She has had three insignificant relapses since coming home three years ago, but is practically well.

He returns, then, in conclusion to the question mentioned above, as to whether this detailed, time-consuming, and often expensive work is worth while from the patient's standpoint. In the myositis-neuritis group there can be no debate, as the smaller cultured series gave much relief in 100 per cent and the larger non-cultured series in 78 per cent. Many factors enter into the same question as regards the arthritic group. Many arthritic patients receive temporary relief with no treatment, many are hopelessly incurable in the face of the most painstaking treatment, and seemingly there is no chance to study such patients in control series. In view, however, of the experimental evidence in favor of a specific etiologic relationship between some strains of streptococci and the joint lesions of chronic septic rheumatism, and because he was able seemingly to obtain by these methods of treatment reasonably good results in 48 per cent of the cultured series and 64 per cent in the non-cultured series, he personally has learned to believe in these principles. He believes firmly in the radical removal of all suspicious surgical foci, and he entertains no regrets in these cases when a suspicious focus is found to be innocent after its removal.

Tuberculosis and its Relation to Industrial Medicine.

In the *Pennsylvania Medical Journal* for November, 1920, TAYLOR states that from an industrial standpoint the question, What shall we do with the incipient, the early favorable, the moderately advanced, and the advanced cases of pulmonary tuberculosis? presents itself in a very serious form to industrial physicians. They are all at work when discovered with the disease. They depend on what they earn to support themselves and, in addition, possibly, a wife and family, or are contributing to the support of other relatives. Taking them

away from work, as we must, evolves responsibilities from which we cannot escape. It seems imperative that every industry should make provision, if there be no beneficial association, to give ample support to all cases of tuberculosis and their dependents. It must be borne in mind that each class of case requires different handling, and the costs of treatment vary.

The advanced case as a rule should not be sent to a sanatorium provided he or she can safely remain at home and the sanitary conditions are such as to allow home treatment, that there are no children in the home, and that nursing care and medical care can be provided. It must be understood that as they are hopeless cases, many soon becoming bedfast, the expenses incident to their care are higher than in any other type, as constant nursing attention and medical advice is necessary.

The moderately advanced cases may be sent to a sanatorium, or at least should remain in a sanatorium sufficiently long to learn from the institution, by the instructions given them, how to care for themselves, manners of living, and prevention of contagion. After a period of stay lasting from six weeks to three months, if their home conditions are satisfactory, they may return.

Early favorable cases should be sent to a selected sanatorium where only cases of this type are admitted; nothing, in his opinion, is a greater wrong than to intermingle these early favorable cases with those suffering from the disease in an advanced form, many of whom are dying. The majority of the early favorable cases will, if given proper treatment, become arrested cases within six months to a year and return to their work. The incipient cases of tuberculosis are kept under a reasonable amount of discipline respecting rest and general health routine, receive a maximum amount of good nutritious solid food, and in addition milk served at regular intervals as well as a maximum amount of sleep.

The rest home should be located in the country, not so far from the city that relatives cannot visit them easily. It is neces-

sary that the house be made attractive in every detail, especially in respect to amusements, reading material, varied diet, cheerful surroundings, and above all conducted by a woman, preferably a trained nurse, who has the personal and executive qualities necessary to the success of such an institution. The incipient case of tuberculosis can safely be housed with any other type of case. They rarely have a cough, their sputum is negative as to tubercle bacilli, and they present none of the symptoms except loss in weight which characterizes the more advanced type of the disease. Therefore, to the rest house Taylor sends not only incipient cases, but also other patients suffering from malnutrition, anemias, nervous asthenics and those having many other conditions in which rest, change of air and scene with proper diet will soon restore to health. It is his policy in every way to prevent these patients from learning that they have ever been suspected of having tuberculosis—in fact, the word never enters any discussion that he may have with the patient. The consequence is that they are not made apprehensive of their physical condition, and return, after three months' stay in the rest home, completely cured, ready to take up their work. The rules governing their care are extremely simple. He insists on a varied but simple home diet of well-cooked foods, served in an attractive manner, and emphasizes the need of the best of butter, eggs, and milk. As rest is of paramount importance, reclining and steamer chairs with rugs are furnished them. Rest in bed each afternoon for one hour is insisted upon, and the retiring hour at night is 9:30. They are allowed to take walks, and as means of diversion have sleigh rides in the winter and picnics in the summer, and other forms of healthful amusement. They must agree never to absent themselves from the premises without first obtaining permission from the one in charge.

The question may arise, "Is it possible to absolutely be sure that the diagnosis is without question correct in all cases sent to the rest home as incipient tuberculosis?"

In answer, he unhesitatingly confesses that possibly quite a number so diagnosed do not have the disease, but in every case the physical signs present, while not absolutely indicative of the disease, point so strongly in the direction of pulmonary tuberculosis that the element of doubt renders them safer in being so classified, which, following his policy, requires that they be taken away from home and given rest-home treatment. For who can tell just when the havoc of the implanted tubercle bacilli begins as a disease process? No disease affecting industry is more important and demands more care and consideration in the details of its management than tuberculosis, and he knows of none where preventive medicine will yield greater returns.

Like the plant which has wilted from want of air, moisture, and sunshine, the incipient tuberculosis patient will revive, take on new vigor and strength, and finally bloom out with a radiance of health, if given rest, food, air, sunshine, and proper environment. In other words, he is given half a chance to fight a ravaging foe.

Intranasal Drainage of the Frontal Sinus Through the Natural Opening.

In the *New York State Journal of Medicine* for November, 1920, UNGER states that the object sought by all physicians in the treatment of frontal (as well as other) sinus inflammations is the establishment of adequate drainage and ventilation. The attainment of this is attempted, in mild cases, by the application of constricting medicines (cocaine and adrenalin) to the frontonasal opening. In more severe cases the middle turbinates and obstructing polyps may be excised. In still more intractable cases the ethmoid cells may be opened, and in the most stubborn cases external and internal operations on the sinuses are performed.

The three factors that prevent proper drainage in frontal sinusitis are: First, the swelling of the nasal mucosa; secondly, hypertrophied middle turbinates; and thirdly, polyps. He believes the first to be the most important. The nasal mucous membrane,

containing much erectile tissue, is subject to physiological engorgement many times during the day. When there is the added stimulus of an infection, the engorgement becomes practically constant.

When it is considered that the frontonasal opening is so small that it often fails to admit the smallest probe it can readily be seen how completely it can be blocked by the swollen mucous membrane.

Adrenalin and cocaine shrink the mucous membrane by direct action on the walls of the arterioles. On normal mucous membrane their action is prompt and efficient. In inflammatory conditions, however, there is exudation of cells and serum about the vessels which prevents the approach of the adrenalin and makes its action slow and incomplete or prevents it altogether. When it is considered, furthermore, that the frontonasal canal is about $\frac{1}{2}$ to $\frac{3}{4}$ inch in length, it becomes apparent how futile, in some cases, is the use of adrenalin for establishing drainage.

Obstructing turbinates and polyps must, of course, be removed.

The method he describes is meant for use in cases in which the natural frontonasal opening is intact and where no operations more extensive than the removal of polyps or of the anterior tip of the middle turbinate have been done. Briefly, it consists in the introduction into the frontal sinus, through the natural opening, of rubber or fabric drainage tubes and their continuous retention in the nose during the course of the sinusitis.

The instruments used are (1) a slender frontal sinus probe, and (2) rubber, silk, or linen catheters of sizes 4-10 Fr. The largest size catheter that the frontonasal opening of a particular case will admit is used in that case. The ordinary urethral catheters can be used for this purpose cut down $3\frac{1}{2}$ inches from the tip and with perforations punched in the sides at intervals of half an inch.

The technique employed is as follows:

The nasal mucosa is anesthetized and the frontal sinus is probed. The probe is first used by itself to determine the size and di-

rection of the frontonasal opening. If the opening is obstructed by the middle turbinate this must be removed. The size and direction of the opening having been ascertained, the probe is then pushed through the lumen of the proper sized catheter to its end. The probe, encased in the catheter, is then reinserted in the frontal sinus. The catheter is then held loosely by the fingers of one hand and the probe is gently withdrawn by the other, leaving the catheter *in situ*. The catheter is then grasped near its entrance into the opening with a nasal forceps and pushed further into the frontal sinus as far as it will easily go. Being flexible it will pass over projections that will block a metal catheter. The lower end of the catheter is then cut off intranasally, so that the remaining portion rests on the floor of the nose. At the end of this procedure there is then left a tube about $2\frac{1}{2}$ inches in length, extending from the floor of the nose up into the frontal sinus. This tube is left in place for one to two days, when it is removed and replaced by another. Before the tube is replaced the sinus can be irrigated.

The catheter is cut $3\frac{1}{2}$ inches long to begin with because its lower end will then project from the nose after its tip is in the sinus and furnish a place for holding it when the carrying probe is withdrawn. If linen or silk catheters are used, they should be dipped into hot water before being inserted into the nose, in order to make them softer.

Observations of an Anesthetist.

RAPOPORT, in the *Boston Medical and Surgical Journal* of November 11, 1920, states that although morphine and atropine as a preliminary to anesthesia should not be used as a routine, in the majority of cases it is a great benefit to the patient as well as the anesthetist. It should not be used in the aged, debilitated, and the very young. But, on the other hand, it is of great advantage to the shocked, highly nervous, asthmatics, and robust. It lessens shock, it diminishes the time of induction,

and less ether is required to keep the patient well relaxed for the operation.

So much for the preliminary treatment. Now, as to induction, the use of gas as a preliminary to ether is one of the greatest additions to the field of anesthesia. Not only do we save time at the induction, but we do away with any struggling or opposition on the part of the patient in the etherizing room. It is pleasant to take, and once the patient is rendered unconscious by the gas, we can easily switch over to ether without the patient recognizing the change. It also does away with the gagging which occasionally occurs at the time of induction.

In concluding he gives a few practical points as observed from his own experience. Above all, he says he cannot emphasize too strongly the importance of the utmost concentration of the mind of the anesthetist on his patient. He must be on the alert all the time. The patient's color, breathing, pulse, and the size of his pupils are things that the anesthetist has to be posted on at every moment of the operation. He must also be familiar with all kinds of operations and their different stages. An operation on the gall-bladder or a pelvic exploration requires a deeper anesthesia than an appendectomy or an umbilical hernia. Moreover, the different stages of any one operation require varying depths of anesthesia.

It should always be the aim of the anesthetist to use as little of the anesthetic as possible. He must be able to tell at a glance how deep the patient is anesthetized, and for this purpose he knows of nothing more instructive than the respiration. It is impossible for him to describe the different characteristics of respiration by which he is able to tell the depth of the anesthesia. This cannot be learned out of a book; it must be acquired by experience.

Another point which is of great importance is the color of the patient. One must never be satisfied with a poor color unless the patient is suffering from asthma. In about 99 per cent of cases cyanosis means either too much ether or mechanical obstruction of the respiratory tract. Be prepared with a nasal tube for every patient

who has a short neck, and use it in every case in which there is trouble with the patient's breathing. It saves one the necessity of continually holding forward the patient's jaw. Have the head and shoulders of asthmatics higher than the rest of the body. Keep the head of short-necked people in extension.

If the surgeon remarks that the patient is rigid, never, in the desire to quickly deepen the anesthesia, pour an excess of ether on the cone all at once. The concentrated vapor inhibits the patient's respiration, with the result that less ether gets into the circulation and he is likely to gag and remain rigid. It must be done slowly at the expense of a little time. If the anesthesia is so deep that the breathing becomes slow and shallow, it means that the patient is approaching a stage when he will stop breathing altogether. Stop the ether at once and wait until the respiration becomes deeper and more frequent.

There is one more important thing which contributes toward good anesthesia and which is frequently overlooked. That is the gaining of the patient's confidence. Do not enter the etherizing room and without preliminaries of any kind start the anesthetic. First get into a conversation with the patient, become acquainted, listen to his heart and count his pulse-rate. Show the patient that you are there for his interest and encourage and assure him that everything will be all right. This will overcome his fright and inspire confidence, with the result that he will take the anesthetic more smoothly and will be better relaxed for the operation.

Last of all, do not consider this job finished when the surgeon gets through with the operation. One must see the patient safely in bed. During the recovery he may vomit and aspirate some of the vomitus, which may result in pneumonia or lung abscess, or his tongue may drop backward, causing asphyxia. One should see that all the moisture is wiped off his body and that he is well covered before he leaves the warm operating-room for colder corridors and elevators. When put to bed, see that

his head is placed in the position in which breathing is accomplished with the least exertion.

The Medical Care of the New-born Infant.

Modern Medicine for November, 1920, says it is an incontrovertible fact that the overwhelming majority of infants during the first few weeks of life are not receiving that intelligent supervision, especially in regard to feeding, that is due them. In the home the physician tends to leave the management of the new-born to the nurse, trained or only practical; or to the mother, as the case may be.

Even in private hospitals the attending physician is inclined to manifest but little interest in the baby, and relies to large extent on the nurse in charge of the nursery, as a rule a fairly competent woman. This, at least, is the experience of the author of this editorial, an obstetrician keenly interested in the normal breast-fed baby.

Sedgwick made the facetious statement that the obstetrical attendant's concern in the main seems to consist in the successful separation of the fetus from the mother, and then is prone to regard the infant merely as the by-product of the process. This is a harsh verdict—but who would dare to deny that it contains a great deal of truth?

The present situation is decidedly unsatisfactory and must be changed. Of course, this means that the customary attitude of the physician attending the patient during labor and the puerperium must change. It seems plausible that if he were fully conscious of the great practical importance of this question, and at the same time felt competent to handle the new-born intelligently, he would without fail exhibit the same interest in this as in any other of the medical problems he meets in his daily work.

At present he is lacking in knowledge concerning the specific medical needs of the new-born. Responsibility for this evident deficiency rests entirely with the medical schools. From this view-point a discussion between an obstetrical and pediatrical teach-

er is of some significance. They must settle their dispute concerning their respective competency—not in the interest of those few babies under their care, but for the sake of the medical students, for the ultimate benefit of all babies, born in years to come, under the supervision of these students as future practitioners of medicine.

Instruction in the medical care of the new-born of necessity will have to be given in the maternity wards, as a part of the general instruction in the management of the puerperium. The obstetrician, therefore, offhand would seem the proper man to do it, granted that he is equipped for the task. Otherwise, he would better leave it to the pediatrician. However, under all circumstances the pediatrician must be given free access to the maternity ward. The obstetrician always will be in need of his advice in dealing with suspected or existing anomalies, either congenital or acquired as the result of birth traumatism. It would seem desirable and entirely feasible to make previous service as interne in the pediatric department a condition for the appointment to residents in the obstetric service.

It is of no particular importance who gives this instruction, but it must be given more efficiently than in the past, if we are to secure practitioners both desirous and capable of taking responsibility for the new-born infant. In the hospital the baby immediately after birth might well pass into the hands of a pediatrician; in practice it will ever be necessary that the physician who attends the mother during pregnancy and labor will attend to mother and baby during the puerperium.

Retention Crypts in the Infratonsillar Nodules as Extensive Harbors of Pathogenic Bacteria.

FRENCH, in the *Medical Record* of October 2, 1920, states that little attention has been paid to the presence of chronic infectious material in the chains of infratonsillar or lingual lymph nodes. The tonsilloscope, however, has discovered that these struc-

tures, when associated with diseased tonsils, acted as pathogenic foci. They have been very briefly described in the text-books. He had studied particularly the chains of nodules lying in the lateral walls of the pharynx and the base of the tongue, directly beneath the faucial tonsils. These often became the seat of chronic infection.

The writer hesitated at first in introducing operative procedures, on account of the underlying venous network of these structures. Operation disclosed the existence, under the nodes, of a smooth, limiting mucous membrane, obviously a fibrous capsule. Examination of the enucleated structure revealed pus and débris. It was clear that such disordered tissue could not be left without danger to the system. The nodules were easily and safely enucleated from the throats of children. In adults, under tonsilloscopic examination, numerous small slits or pin-points, flush with the surface of the nodules, were shown, with the aid of a thin bent probe, to be minute crypts containing necrotic material, with pathogenic bacteria. The nodules were not present in a state of health. They appeared in the form of foreign structures, set upon the submucosa like a plaster form upon a ceiling. The underlying capsules were a continuation of the tonsillar capsule. The size varied from one-eighth to three-eighths of an inch in children; in adults they increased progressively in size. In children the masses were smooth, round-topped, and firm; in adults they resembled irregular folded material placed on edge. The interspaces formed deep pockets. The lingual tonsil appeared enlarged far less frequently than the faucial tonsil. The surface of the nodule might contain anywhere from 25 to 100 or more openings or crypts, varying in depth; some were shallow, but some were deeply penetrating, and with small mouths, often practically sealing up necrotic material. Such crypts sometimes evacuated themselves from overdistention. Thus far the streptococcus hemolyticus, streptococcus viridans, and staphylococcus aureus had been isolated from these crypts.

The diagnosis was made by means of the tonsilloscope, and with the use of a tongue depressor specially designed by the writer to facilitate examinations. The key to operative measures lay in the use of a block molded to fit over the angle and under the lower edge of the jaw, in such a way as to serve as a resisting wall for an undercutting scoop of the arc of the Sluder guillotine. With this resistance the enucleation of a pharyngeal nodule was quite simple. The technique of the procedure was given in detail.

Disposal of lingual tonsils presented more difficulty, and the best method had yet to be evolved. These structures were so close to the orifice of the larynx as to present a particular problem. Hemorrhage from nearby large vessels was one danger, and the risk of edema of the larynx from septic obstruction was to be feared. A possible solution would be to shave the tops of the nodules, thus cutting away their crypts and freeing the necrotic material. At all events the nodular trunks and pharyngeal branches could be safely enucleated. The blood loss during these operations had been found to be negligible. Any hemorrhage had been so far arrested by pressure by stick-sponges and counter-pressure outside under the angle of the jaw.

The operations were performed under general anesthesia. Other methods, such as curettage, and emptying of the crypt contents, could be tried in selected cases, and in those patients who refused more radical operation.

The Need of Vitamines.

HAWLEY, in the *Bulletin of Pharmacy* for November, 1920, reminds us that animal experiments show conclusively that each group of vitamins bears a specific relationship to certain phenomena of growth, nutrition and health. Thus the removal from the ration of the fat-soluble A group is followed by impaired growth, a lack of normal body tone, a dry inflammation of the cornea called xerophthalmia,

poor tooth development, rickets, and pellagra.

Withdrawal of the water-soluble B group causes impaired growth, under-development, malnutrition, marasmus, and polyneuritis (beriberi).

Deficiency in water-soluble C vitamins results in impaired growth and scurvy.

Quite recently a preparation has been put on the market intended for therapeutic administration to patients who, from the view-point of the physiologist, are not normal—they are either ill or convalescing from some illness. In nearly all illnesses the digestive organs are impaired, and it is, therefore, unlikely that they will be equal to the task of acting upon the ingested foods so as to liberate their vitamin content. Besides, it is frequently undesirable to give the kind and quantity of food which would be necessary to yield a sufficient amount of a desired vitamin. One rarely prescribes a mess of spinach to a patient acutely ill or to a convalescent with a digestion that is impaired, just because the vitamin that is present in spinach would be desirable.

A scientific combination of the three known types of vitamins affords the physician the opportunity to administer them in a concentrated form without guesswork as to their actual presence, and without a ruinous tax on the very organs which he is attempting to bolster up.

Direct evidence of the effectiveness of extracted vitamins is to be found in recent scientific literature. In the *Journal of Biological Chemistry*, Eddy, a renowned worker in the field of nutritional chemistry, makes this point in a telling manner by showing that children whose previous diet contained theoretically enough vitamins were stimulated to rapid growth and development after a small quantity of extracted vitamins had been added to the diet. His frank explanation of this phenomenon is that extracted vitamins are more readily available to the body than those normally contained in food.

Perhaps it is not going far astray to say

that a scientific combination of vitamins should be prescribed in all cases of lowered body tone and subnormal nutrition from any cause, and in diseases due primarily to a lack of vitamins—deficiency diseases. In the list of deficiency diseases may be included scurvy, beriberi, marasmus, malnutrition, and possibly rickets and pellagra. As a nutritional tonic such a combination is at once suggested in the convalescence from all infections, febrile and wasting diseases.

Every one knows how languid and ambitionless the convalescent from influenza and similar infectious diseases feels. Much of this weakness is attributable not to lack of food, but to a failure of assimilation, and consequent undernutrition.

In tuberculosis one of the prime objects of the treatment is to force nutrition. How can this be better accomplished than by giving vitamins as a supplement to suitable dietary measures?

In simple anemia, chlorosis, and other blood diseases, successful treatment often depends upon prompt assimilation of concentrated nutrients. This is just another way of saying that the patient needs vitamins.

The subject is an interesting one; one we are going to hear much more about during the years just ahead of us.

Warning Against Orange Beverages for Medicinal Purposes.

The *Boston Medical and Surgical Journal* of November 25, 1920, states that a recent issue of the Public Health Reports has called attention to the fact that in some instances mothers, by the labels and other advertisements, are feeding "fake" orange beverages to their children under the impression that they are giving them the orange juice recommended by their physicians. It has been stated by the Bureau of Chemistry that in most cases these beverages are nothing but sweetened carbonated water, flavored with a little oil from the peel of the orange, and artificially colored;

as a rule these preparations are of no medicinal value, because they do not contain the organic acids and the vitamins which are contained in real orange juice. Manufacturers of these spurious orange beverages often seek to deceive the purchaser by means of suggestive statements and pictures prominently displayed to attract instant attention, while, to escape prosecution for direct violation of the food and drugs act, they print other statements correcting the misleading features in inconspicuous places. It has been ruled by the Bureau of Chemistry, therefore, that the terms, "ade," "squash," "punch," "crush," and "smash," when used in conjunction with the name of a fruit, can be applied correctly only to beverages which contain the edible portion of the fruit or juice of the fruit named.

In order to prevent mothers from being misled by deceptive labels and advertisements, it has been suggested that physicians, in recommending orange juice for children, warn the mothers against the substitution of the beverages for the juice of real fruit.

Ethyl Chloride.

GUEDEL, in the *Indianapolis Medical Journal* for November, 1920, states that this agent is frequently employed for short anesthetics, but that its action is little understood by many who employ it.

It is the most rapid and powerful single anesthetic agent known, except ethyl bromide, which is not used alone.

With an overdose of ethyl chloride, two entirely different sets of symptoms may present.

Assuming five patients to be overdosed, four of them will manifest the muscular spasm type of poisoning, while the fifth will manifest the respiratory depression type.

Spasm Type.—With the too rapid administration of this agent to overdosage, the patient will display at first clonic, followed immediately by tonic spasm of the muscles of the face and throat. There will appear a remarkable sardonic grin, accom-

panied first by tonic spasm of the masseters, locking the jaws with an unbelievable rigidity. About the same time there occurs a crowing respiration due to laryngopharyngeal spasm. With the continuance of the drug, respiration becomes more embarrassed by the progressively increasing spasm of the throat muscles, until it is cut off as effectively as if the trachea were completely constricted, and a definite state of asphyxia is present. Under this circumstance it is extremely difficult to get the mouth open, and the patient may die before this is accomplished. Death here is due to active asphyxia.

This spasm may occur in any type of patient. There is no way to determine before the anesthetic is administered what to expect. If the anesthetic is administered by a novice, it is wise to insert a mouth-gag before starting.

Respiratory Depression Type.—The incident of this is less frequent than the spasm type, and while more frightful in the beginning, it is easier handled if the anesthetist be alert.

With an insidious onset, the respiration during the late induction stage, or at any time during the conduct of anesthesia, becomes quietly and progressively shallower until it ceases altogether. This course from the onset consumes only about twenty to forty seconds. The picture is one of fatal shock, with extreme pallor, wide open, staring eyes with completely dilated pupils, and absolute muscular flaccidity, with no effort at respiration whatever. It is notable that at this point the pulse shows no change. With the mask removed, artificial respiration is to be started at once, making sure that there is the passage of air into and out of the lungs. The ethyl chloride is so rapidly eliminated from the circulation that but a few artificial respiratory movements are sufficient to allow the excess gases to be carried from the region of the medulla, and spontaneous respiration is again inaugurated.

Here again there is no way of anticipating this accident. There is no particular

type in which it occurs. It, like the spasm, must be watched for and handled as it appears.

When not properly handled, death will ensue from passive asphyxia, with the heart stopping in from one to four minutes after cessation of respiration.

Guedel concludes by saying that ethyl chloride is a very useful anesthetic agent, but, like the racing automobile, it should not be handled by a novice.

The Passing of the Septic Hand.

In an editorial on this subject the *Boston Medical and Surgical Journal* of November 25, 1920, states that when one considers the inestimable importance of the human hand in performing the work of the world, it is somewhat surprising how long an intensive study of its infections and the correct operative treatment was delayed. It was not until the work of Kanavel in this country that the subject received the serious attention which it deserved. Before this era almost anybody was considered competent to treat and operate upon a bad septic hand, though a simple operation for acute appendicitis called for definite surgical skill; the fact being that a careful and well-planned operation to save the hand is much the more difficult.

It is a cause for congratulation that during the past few years the patient with a serious septic hand is rarely seen in the surgical out-patient clinics of our large hospitals.

There are two reasons for this fortunate fact. First, the general public are better educated to the importance of attention to septic troubles of the fingers, and minor cuts and scratches.

It is a common occurrence at the present time for people to seek relief for these troubles at the hand of the surgeon, as the patient says: "I was afraid I might have a badly infected finger or hand unless I had it fixed properly at first."

The other reason for the great lessening of these cases is the improvement of oper-

ative procedures for the relief of the less serious septic conditions; careful thought and reasoning as to the best methods of treating the different types of infection, superficial sepsis, superficial felons, tenosynovitis, and the like.

It is indeed no small triumph that these unfortunate results of ill-advised treatment, which sometimes cripple the wage-earner most grievously, or render him a charge to his family, are at present so comparatively rare.

Alcohol, Fatigue, and Mental Activity.

In an editorial on this subject the *British Medical Journal* of November 6, 1920, states that the Medical Research Council has published a third memoir dealing with experimental investigations of the influence of alcohol on mental activities. The experiments recorded were performed at the Psychological Laboratory, Oxford, by McDougall and May Smith; some of them deal with the action of chloroform, opium, strychnine, and caffeine, but they confine themselves to a description of those concerning alcohol. These investigations, like Vernon's experiments, described in the issue of October 23, are open to the criticism that they were made on two subjects only; against this must be set the fact that the writers, following River's example, disguised the drugs taken and employed control mixtures indistinguishable from them, so that it was possible to eliminate any suggestion which might arise from knowledge as to which drug (if any) was being taken.

Three methods of measurement of the effects of drugs were employed. The first test was the marking (by a pen) of red circles, and (by a mechanical device) of blue circles, printed on a continuous band of paper tape, which was made to pass at the rate of 5.8 circles a second behind a window in the top of a desk. In the second test the subject was required to reproduce verbally in correct sequence a complete list of forty words previously dictated to him at the rate of thirty a minute; each pair of

words had some association, the appreciation and recollection of which formed an important part of the mental test—for example, mountain, plain, ugly, beauty, Venus, Greece, oil, smooth, etc. In one series of experiments the first and second tests were combined. The third test was the counting of the rate of reversal of the apparent direction of rotation of the shadow of a laboratory "windmill." McDougall has previously shown that an observer has a certain power of favoring one or other phase of such an alternating perception, of which the ambiguous cube and staircase figures are more familiar examples.

For the purpose of the present study the plan was adopted of holding fast each phase for the longest possible period, and when in spite of the mental effort the direction changed, of endeavoring to maintain the new phase. Using the "dotting machine," McDougall and Miss Smith found that absolute alcohol mixed with water increased the mean number of errors from 80 to 97 when 10 Cc. had been swallowed, from 77 to 109 after 15 Cc., and from 70 to 97 after 20 Cc. Similarly, the ingestion of alcohol was followed in memory tests (although here the experiments were fewer) by a well-marked loss of power of recall, and in the windmill tests, which appeared to afford a specially delicate index, by a striking reduction in the number of phase alterations, which was taken to denote a raised resistance of the cerebral synapses.

It will cause no surprise to learn that the taking of alcohol was followed in all the tests by a subjective feeling of greater ease—in the "dotting test," for example, by a "pleasing conviction" (later found to be erroneous) that the work done was unusually good. Experiments were also undertaken to determine the effect of different dilutions of alcohol and of variations in the period which had intervened between its ingestion and that of a meal. In one set of experiments the errors increased 160 per cent after taking 20 Cc. alcohol in 33-per-cent solution, compared with 22 per cent after taking the same amount in 10-per-cent solution. When 30 Cc. of alcohol diluted

to 60 Cc. was taken directly after a meal, the increase of errors was 6 per cent; the same dose taken from two to eleven hours after a meal was followed by an increase of errors amounting to 118 per cent. These results are in accord with those recently published by Dr. Vernon. It appears, however, that in one specially limited and sharply defined set of circumstances alcohol may exert a beneficial effect on mental activity.

Using the "dotting machine," these investigators, in the course of an examination of the fatigue which ensues from a voluntary cutting down (for three nights) of the usual amount of sleep, found that during the first three days the average errors became fewer; during the succeeding thirteen days the errors gradually rose to a number considerably higher than normal, the return to normal being somewhat irregular. In the first two phases of this cycle the increase in the number of errors following an ingestion of alcohol was well marked; toward the end of the fatigue cycle, however (on the thirteenth and fourteenth days, for example), the number of mistakes made was considerably diminished after 15 Cc. of alcohol had been taken. Similar results, which could be shown not to be due to habituation to the drug, were obtained in experiments in which the memory test was employed.

In examining the effect of alcohol in the normal, non-fatigued state, a few instances were encountered in which a decrease in the number of errors followed the taking of alcohol; in these cases, with one exception, the statement (recorded before the test) of subjective feeling was to the effect that the experimenter felt "very tired." In certain stages of recovery from fatigue the taking of alcohol would therefore appear to be followed by an increased mental activity, as illustrated by these tests. The writers suggest that if these results are not purely personal, "then probably one reason for the very uncertain and contradictory results that investigators record with alcohol is the varying condition of the body with regard to fatigue."

Influence of Dilution on the Toxicity of Alcohol.

WALTER, in the *British Medical Journal* of November 6, 1920, in a letter to the editor says, adverting to Dr. Vernon's experiments on dilute alcohol and drunkenness, recorded in the *Journal* of October 23, he made some similar observations, not on himself, but on a German guide in Berlin in 1912.

This man easily and regularly drank over twenty liters of beer in the day. Walter paid for them himself, so the facts are engraven on his memory. He started with a couple before breakfast, four between breakfast and lunch, a couple of liters at lunch, three more before dinner, and the remainder easily between dinner and bedtime. A little of it was Pilsener—4 to 5 per cent of alcohol; but most of it was the stronger Munich—6 to 8 per cent alcohol.

His German friend thus consumed over thirty-seven ounces of absolute alcohol in the day, but he did not exhibit the least sign of inebriety.

The case proved to his satisfaction that where alcohol is diluted twenty or thirty times with water it is almost non-intoxicant.

Seeing the enormous quantities of bock consumed in Berlin he sought in the hospitals evidences of cirrhosis or other signs of alcoholic poisoning. He found no more than would be yielded by any other city of its size. In Munich, he was told, there are some evidences of cardiac hypertrophy, due simply to the strain of pumping so many gallons of fluid through the kidneys.

Treatment of Subacute Nephritis by Kidney Decapsulation.

HORDER, in the *British Medical Journal* of November 13, 1920, states that he does not go fully into the theoretical aspects of the subject, but thinks it is better that actual experience of the procedure should be regarded as the main part of his communication. It would, of course, be absurdly unwise to dogmatize upon so little material.

But consideration of his four cases, together with careful analysis of all the available records, leads him to the conclusion that there is a clinical type of nephritis in which—when thorough general measures have proved unavailing, and a reasonable time element, during which it is known that resolution not infrequently occurs, has passed—decapsulation becomes a definite indication and promises satisfactory results. This type is, he thinks, not inappropriately termed subacute nephritis, and is characterized by extensive and considerable edema, massive albuminuria with casts in the urine, toxic symptoms of the chronic uremic kind, and an absence, or the presence in only slight degree, of cardiovascular changes. By cardiovascular changes he means arterio-capillary fibrosis, hypertrophy of the left ventricle, arterial hypertension, and renal degeneration. This was the state of things in both of his cases that resolved completely after the operation. In the two cases in which some improvement followed the procedure, but no cure, definite evidence of cardiovascular changes was present, and the type of disease suggested a general involvement of the arterial system rather than a local inflammatory process in the kidney.

This consideration confirms the general idea that subacute nephritis is a different disease altogether from generalized arterio-capillary fibrosis, as a part of which process the kidney vessels suffer early, and the kidney substance suffers secondarily to the disease in the vessels. In subacute nephritis the causative agent may be regarded as either past and over, or, if still present, it may be regarded as producing its effects primarily upon the kidney parenchyma; in chronic interstitial nephritis, granular kidney, and (or) the arteriosclerotic kidney the causative agent may be regarded as operating chiefly upon the whole arterio-capillary system, including the kidney glomeruli.

He refers to the fact that analysis of the recorded cases of decapsulation confirms his own experience that it is these cases of subacute nephritis which are specially adapted to this form of treatment.

Horder points out that Boyd has quite recently (Association of Physicians' meeting, Manchester, 1920) reported such a case—a man aged forty-one, in whom dropsy was extreme, necessitating several tappings of the abdomen and the legs; albumin was present to the extent of 32 grains to the ounce, with dyspnea and severe headaches. After five months' treatment, with gradual decline, the kidneys were decapsulated. Diuresis began at once, and progress was rapid. Three years later the patient was reported to be at work and well, although the urine was still albuminous. In this case the systolic blood-pressure was not higher than 130 mm. Hg. In a second case reported by the same author, similar clinical features were present; the blood-pressures were even lower (systolic 79, diastolic 55); acute uremic symptoms appeared in this case and the kidneys were stripped during this serious phase. Five months after the operation this patient was said to be in apparent good health, although a trace of albumin was present in the urine.

Horder does not say that decapsulation does no good in cases of arteriosclerosis with kidney involvement—several scattered cases in the literature, and his second pair of cases, prove that it does do good; he wants to emphasize the opinion that the type of case most suited to the treatment, and most likely to justify its adoption, is not this type. For cases of advanced granular kidney he feels confident that, from a study of the records, the operation is contraindicated.

One other clinical type of nephritis requires brief mention, and that is acute nephritis. He has had no experience with decapsulation in this disease. It is probable that the earliest of all recorded cases—namely, of Harrison—were cases of this kind, though not recognized as such prior to the operation. It is certain that not a few of Edebohl's cases were suffering from acute nephritis. The occurrence of hematuria seems to have stimulated the surgical instinct. It is highly probable that the kidney puncture or incision undertaken by

these pioneers did good. The doubtful point is whether the procedure was necessary in order to secure the result. This consideration does not make it illogical to say that puncture or incision of acutely inflamed kidneys is, in his opinion, quite justified whenever anuria and uremia persist despite energetic general measures.

Concerning the mechanism by which the results of decapsulation are brought about he has little or nothing to say of actual fact. It is generally thought that depriving a kidney of its capsule, and thus bringing the cortex into close contact with the perinephric tissues, leads to the formation of new vessels which anastomose with those of the kidney itself, thus providing for the removal of inflammatory exudates and assisting in reestablishing renal function. And although the results of experimental work by various investigators have been at variance on this point, this process of formation of new vessels may be regarded as actually taking place. In 1905 Boyd and Beattie reported the results of a post-mortem examination on a case of decapsulation, and demonstrated these new and anastomosing vessels *in situ* four months after the operation had been undertaken. But we are faced with a difficulty: The good effects of decapsulation are immediate, whereas this new system of vessels must necessarily take time to form. Are these rapid effects due to the relief of tension? This can scarcely be so, seeing that—apart from the cases of acute nephritis, which are in a different class—little or no actual tension is seen to be present at the time of the operation. The question must remain for the time unanswered—unless it be an answer to say that the mechanism of production of the diuresis and disappearance of edema and of symptoms generally is of the same kind as in the process of “wet cupping.” For the process of decapsulation *does* amount to a very direct and very effective “wet cupping” of the kidney itself, and may therefore be not inappropriately compared with the indirect and too often ineffective “wet cupping” of the loin formerly in vogue in the treatment of nephritis.

We know very little about the exact relation which the perinephric tissue bears to the capsule of the kidney and to the kidney proper. We get glimpses at times of possible important bearings of this cellular tissue upon the organ embedded in it and also of a converse relationship. But actual observations and experimental work are as yet very slight. Necropsies carefully undertaken in cases of chronic nephritis frequently reveal, even to the naked eye, varying degrees of perinephritis, and (though chiefly in arteriosclerotic cases) new vessels of not inconsiderable size are seen entering the kidney capsule.

Standardized Roentgen Ray in the Treatment of Skin Diseases.

Fox, in the *New York Medical Journal* of November 27, 1920, in concluding a paper on this topic, states:

1. The Roentgen ray is probably the most useful therapeutic agent for the treatment of skin diseases.

2. Its versatility is shown by the great variety of conditions in which it can be used, including inflammatory diseases, those depending on epilation, pruritus and hyperidrosis, lymphatic disease and cancer.

3. It is only by means of accurate standardization that its full value can be realized and its dangers eliminated.

4. Standardized treatment requires the use of a Coolidge tube and interrupterless transformer. The quantity of ray can then be measured by pastilles or by arithmetical computation.

5. The routine use of pastilles is unsatisfactory, as considerable experience is required and as they introduce the element of personal equation:

6. By means of the simple method of computation devised by MacKee and Remer, the treatment of skin diseases by the Roentgen ray has been revolutionized and a great contribution made to dermatological therapeutics.

7. The most brilliant results in his experience have been attained in eczema and

in ringworm of the scalp, where the Roentgen ray is certainly the method of choice.

8. It has also been of great value in acne, psoriasis, seborrheic eczema, lichen planus, and epithelioma.

9. In chronic sycosis, localized hyperidrosis, and some cases of localized pruritus it is the only remedy (except radium) that can effect a permanent cure.

10. Leukemic conditions and mycosis fungoides cannot be even temporarily improved by anything except the Roentgen ray (or radium).

Resuscitation in Death Under Anesthesia.

In the *British Medical Journal* of November 6, 1920, FISHER says it may seem paradoxical, but it is nevertheless true, that the manipulations of cardiac massage fortuitously produce a better amplitude of respiration than is obtainable by the external artificial methods. It is difficult, therefore, to understand the reason for carrying on artificial respiration concurrently with cardiac massage, as is so frequently reported. If cardiac massage is being performed lung ventilation at once ceases to be a matter of concern; any accessory means employed is redundant. In the bimanual manipulation of cardiac massage the dome of the diaphragm is forcibly raised simultaneously with compression of the front of the chest, and a forced and complete expiration is thus brought about. This is followed, as the pressure is suddenly released and the descent of the diaphragm is aided by that of the liver (which is levered down by the back of the hand), by a deep inspiration. In comparison with Sylvester's method the effect upon the freedom of respiration is audibly greater; this is what would be expected if one considers that the diaphragm, the chief factor in the respiratory act, is directly brought into play. It is important to bear in mind this contingent incident to cardiac massage, for in cases of respiratory arrest with gradually weakening heart-beat an

earlier decision can be made to undertake a procedure by which not only the circulation but the respiration will benefit.

Cardiac massage has an influence upon the circulation that he has not seen previously described. Well before a first heart-beat is initiated a change in the appearance of the patient is witnessed, the pallor of the skin gradually being replaced by a perceptible flush. This indicates in the first place that the manipulations supply a part of the necessary force—previously in abeyance—to propel the blood stream, and by the agency of the intracardiac valvular arrangements set in motion an artificial circulation that is comparable to a physiological model made up with tubing and a Higginson's syringe. In one of his cases the intraocular tension was observed to improve, and in Mollison's published case the pupil of the eye was observed at this time to become smaller. The heart is at first uncertainly palpable in its extreme diastolic flabbiness, but prior to the occurrence of its first contraction it is felt gradually to become more firm. The first heart-beat is minimal, and of the character of a "twisting kick," and the contractions, once started, assume regularity and gain strength as the manipulations proceed, until after some six to twelve contractions a maximum excursion is reached, which remains constant, at remarkable vigor.

The staircase phenomenon of progressive augmentation is attributed to the beneficial effect of contraction. The extraordinary force of the maximal cardiac contractions is regarded as dependent upon increase of muscle fiber length that occurs with exceptional ventricular relaxation and distention. Other influences that may work to the same end are the unprecedented cardiac rest, the enhanced coronary circulation consequent upon massage, the persistent abeyance of governing inhibition, and cumulative muscular and augmentor stimulation mechanically induced. However this may be there appears reason to continue with massage until automatic contractions are well established at maximum vigor, as

reflected in the radial pulse. In a case in which he ceased massage before the heart-beats had become maximal they again stopped, and failed to recur in spite of renewed intervention. In cardiac massage the auricular parts of the heart are not accessible to the manipulating hand, approach being hindered mesially by the inferior vena cava, and from before by the coronary ligament. Practically it is the ventricular part of the heart only which is squeezed; if an attempt is made to include the auricular portion within the scope of the operation, the heart is lost from the grasp, and the respirations become inadequate or cease.

It would appear that in the initiation of the heart-beat artificial circulation must constitute an initial causal factor that is of paramount importance whatever may be the actual determining exciting cause. Possibly an artificial circulation through the cardiac and central nervous tissues is all-sufficient, by its influence upon elimination and supply, to reconstitute a normal state in which functional activity becomes spontaneous. The cause of the heart-beat, according to present physiological teaching, is said to lie in the cardiac muscle, the salts of the blood supplying the osmotic conditions that lead to its irritability and contractility, and affording the necessary constant stimulus for the heart's automatic action. But it is difficult to conceive in cases such as emotional syncope, where these conditions have been little disturbed, why the heart should remain permanently arrested in action and not spontaneously restart beating. Some other than an inherent exciting factor would seem, therefore, not to be precluded. It is possible that once nutritive conditions are restored and the irritability of the heart is raised again to a susceptible threshold, it responds by a first beat to the mechanical stimulation of the hand (or to an artificially produced intracardiac tension, as demonstrated experimentally by Gaskell with the apex of a frog's heart).

Further observations, corroborative and

otherwise, are required of clinicians who have occasion to resuscitate by cardiac massage cases of death under anesthesia, and it will be of great help if an understanding of the processes concerned is quickened by a clear pronouncement by physiologists, to whom we must look for guidance and more definite direction.

The methods of performing cardiac massage are as follows:

Subdiaphragmatic Massage.—An opening is made in the epigastrium to the left of the middle line, and large enough to admit a hand, which is passed, palm upwards, between the left lobe of the liver and the diaphragm. The fingers are pushed well backward and upward against the left cupola of the diaphragm, and a forced jabbing movement is made behind the ventricular region of the heart, so as to squeeze it effectively against counter-pressure made by the other hand on the precordial region of the chest wall. The compressions are repeated at a rate of about forty a minute (a more rapid rate is not practicable), and are carried on until the heart-beat is reestablished with regular rhythm and maximal power as reflected in the pulse. The abdominal wound is then sutured.

Transdiaphragmatic Massage.—This is a technique devised by Bost. The abdomen is opened as before, and the further steps are only proceeded with if subdiaphragmatic massage fails. The costal attachment of the diaphragm is divided sufficiently to force an opening into the left pleural cavity, through which the right hand is insinuated, and the heart grasped and squeezed as it lies in its pericardial sac. Artificial respiration must be carried on throughout the operation. In the case recorded by Bost the measure met with success after failure of the subdiaphragmatic method.

Transpericardial Massage.—This very difficult method has not in practice met with gratifying results. A flap of the precordial thoracic wall is raised, the pericardium opened, and the heart directly squeezed.

Supradiaphragmatic Massage.—This method affords ready access. A lower intercostal space on the left side is quickly opened by a lengthy incision, well retracted, and a hand is introduced into the left pleural cavity. The heart, enclosed in its pericardial sac, is grasped and squeezed. He has seen no mention of such an operation being designed to meet the occasion. With failure by subdiaphragmatic massage it arises as an alternative to the method designed by Bost, who claims as an advantage of his plan that occurrence of pneumothorax is practically precluded by the close fit of the diaphragmatic opening to the wrist, and that artificial respiration can be efficiently carried on.

The Pharmacological Action of Salvarsan.

In the *Journal of Laboratory and Clinical Medicine* for October, 1920, JACKSON and RAAP state that first-class preparations of salvarsan have almost no direct action on the bronchial musculature of the dog. It seems obvious that acute symptoms resembling anaphylactic shock, or the so-called "nitritoid crises," if produced by good preparations of salvarsan cannot be due to a spasmodic contraction of the bronchioles. But they are not sure that this action might not occur in the case of especially toxic samples of the drug.

They have studied the action of salvarsan on the pulmonary pressure by means of an especially sensitive method. They believe that even the smallest injections of salvarsan exercise some immediate action on the pulmonary pressure. Its detection depends only on the sensitivity of the method employed for its investigation.

When the pulmonary pressure has been greatly raised by salvarsan they have noted that injections of adrenalin tended to lower this pressure, and also to restore the excursions of the pulmonary pressure due to the respiratory movements of the lungs, when these had been previously greatly reduced by the salvarsan. They believe this results

mainly from a mechanical shifting of the blood from the action of the adrenalin on the systemic vasculature.

When solutions of salvarsan are injected into the general circulation by way of the femoral artery the pulmonary blood-pressure is still raised by the drug. But the rise in pressure is less than if the drug were injected by the femoral vein.

When solutions of salvarsan are injected into the portal vein and are thus carried through the liver before passing into the general circulation, it is found that the drug produces but little if any effect on pulmonary pressure, although if the dosage is very large the pulmonary pressure may be raised slightly, apparently only as the result of an increased volume of fluid in the vessels. But toxic doses thus injected tend to lower the pulmonary pressure.

They believe this action of the liver is brought about by a precipitation of the drug in the capillaries and arterioles of the liver. This apparently does not correspond to the ordinary detoxicating action of the liver as manifested on many poisons.

This precipitation in the liver takes place quickly, but it does not prevent some portion of the drug from passing on into the general circulation. The systemic pressure may fall to a proportionately much greater degree than does the pulmonary pressure.

The Mechanical Effect of Fluid in the Pericardium on the Function of the Heart.

The *Indian Medical Gazette* for November, 1920, writing on this subject under the heading of "Psychological Notes," states that Yas Kuno (*Journal of Physiology*, Vol. LI, Nos. 4 and 5) describes experiments designed to throw light on the effects of increasing the intrapericardial pressure. Most of the experiments were carried out on the heart-lung preparation in dogs. Ringer's fluid was introduced into the pericardium under pressure. The pressure in the pericardial cavity, aorta, and vena cava

were recorded simultaneously. The following important conclusions were arrived at:

1. A very small amount of fluid in the pericardium causes diminution in the output of the heart. By further addition of fluid the output diminishes regularly,

2. The arterial pressure changes only slightly until the amount of fluid in the pericardium reaches a certain limit. Beyond this limit the addition of a small amount of fluid causes a distinct fall of arterial pressure.

3. The height of intrapericardial pressure which brings the circulation of blood to a standstill is just the same as that of venous pressure. If the venous pressure be raised during the standstill of the circulation, the blood-flow is restored.

4. In the intact animal it is very difficult to raise the venous pressure by injection into the veins. An infusion of a large amount of blood causes no rise of venous pressure nor dilatation of the heart, or only a brief one. Such an infusion is, therefore, of no advantage to the circulation, which thus is hindered by pressure of fluid surrounding the heart.

5. Adrenalin diminishes the volume of the heart; the intrapericardial pressure may therefore be decreased. In the intact animal it causes also a slight rise of venous pressure. It therefore affects very favorably the heart when compressed by fluid surrounding it.

What Are Vitamines? And What They Do.

The *Indianapolis Medical Journal* for December, 1920, in an editorial on this subject, reminds us that in the February, 1917, issue of that journal it called attention to an article in the *Schweizer Arzt* by Stirnimann, who had made studies of nutrition and growth upon subjects dieted with artificial excess of vitamines made from rice pericarp. After animal experimentation, he also fed the solution to children in an orphan asylum, aged two to sixteen years; forty-three per cent had goitre. The test lasted four months. The patients were un-

derweight and normal controls. One group received butter, the other none. The controls had no special diet. The underweights, who received the equivalent of half a grain of vitamine daily, lost no weight. Those who received five grains of butter daily lost no weight, and in both there was an aggregate gain of weight over normal. In these experiments the individual child showed under excess of vitamine, increased gain in weight. In some instances there was some retardation of growth.

Since the importance of vitamines has come into prominence, the U. S. Department of Agriculture at Washington has sent out printed matter concerning the question, What are vitamines? It says, "It is best described by what they do." This source gives us condensed information worthy of reproduction.

That the vitamines are compounds absolutely essential in the food, in order to maintain the weight of the body and produce growth, has been definitely proved. The lack of vitamines causes deficiency diseases, so named because they are due to lack of something in the diet. Vitamines are present and are needed in such small quantities in the food that chemists have not yet been able to isolate them from the many other compounds which are in foods. For this reason we know very little of the vitamines.

According to a statement by John, in charge of nutrition work in the Bureau of Chemistry, U. S. Department of Agriculture, vitamines have been classified into three different types, depending upon the functions which they have in promoting well-being and growth.

The first type is known as water-soluble vitamines, and these are necessary in order to obtain growth from food. Lack of these causes beriberi, which manifests itself by disease of the nervous system and by other symptoms. These vitamines are found in seeds, in green plants, in certain bulbs and fleshy roots and fruits, and in milk and eggs, as well as in certain organs in the animal body. The seeds referred to include beans, nuts, and the various cereal

grains. When cereals are very highly milled in order to obtain a very fine white flour, a large part of the vitamins may be removed. Vitamins are also lost when rice is polished in order to remove the outer layers, which contain most of the vitamins. It is for this reason that a diet consisting mainly of polished rice may cause beriberi; while unpolished rice does not cause this disease.

The second type is known as fat-soluble vitamins, and these are found in butter, eggs, milk, and in certain animal organs such as the heart, kidneys, and liver, and to some extent in other fats, as well as in green vegetables. They also exist in smaller quantities in certain seeds. When fat-soluble vitamins are absent from the diet animals and man are subject to a disease of the eyes, which appears to be related to xerophthalmia, and which, if prolonged, may produce blindness.

The third type is known as antiscorbutic vitamins—that is, those which prevent scurvy, which manifests itself by disease of the bones as well as in other ways. These vitamins are found in oranges, grapefruit, lemons, and other citrus fruits, and in green vegetables such as tomatoes, spinach, and lettuce, and in eggs and raw milk. The drying of vegetables frequently destroys the activity of the antiscorbutic vitamins. The best source of vitamins is in the leafy parts of vegetables, and this is one of the reasons why spinach, lettuce, and cabbage are valuable foods.

We sincerely hope the efforts of Parke, Davis & Company to give the profession a preparation of concentrated vitamins in a convenient form for therapeutic use will meet with success. [This has now been done.—Ed.]

Concerning vitamins we may conclude that they are essential to nutrition. If many of the diseases which we know little about are caused by the disturbance of nutrition, then the vitamins must be considered as a factor. If one is to use them as therapeutic agents we especially may look for relief in deficiency diseases and those characterized by disorders of nutrition.

Pernicious Anemia.

CARR, in the *American Journal of the Medical Sciences* for November, 1920, in reviewing the results of his study of one hundred and forty-eight cases, finds:

1. The clinical complex known as pernicious anemia presents certain characteristic blood findings, particularly the high color index, the presence of many large erythrocytes and of nucleated red cells, especially megaloblasts, and a tendency to a leukopenia, with a relative lymphocytosis; the clinical symptoms, though secondary in importance from the standpoint of diagnosis, are yet distinct and definite. The progressive weakness, the gastric disturbances, the dyspnea, pallor, the cardiac findings, and the edema of the feet are the most typical and constant findings.

2. Though pernicious anemia has its own characteristic diagnostic findings, these may be simulated closely by anemias resulting from various diseases; in fact, the blood picture of pernicious anemia may be presented exactly as the result of some definite septic, toxic, or malignant condition. The diagnosis should rest not on the blood findings alone, nor on the blood findings and symptomatology, but on these two features in the absence of any discoverable cause for the anemia.

3. The disease is more common in males, and is most frequent in the fourth and fifth decades of life.

4. The cardiac symptoms and physical findings (the murmurs and the dilatation of the heart) are so constant as to be looked upon as among the most common symptoms of the disease. Anatomically valvular disease is not a part of pernicious anemia; the cardiac findings are the result of myocardial weakness and relative insufficiency. Ascites and anasarca are not symptoms of pernicious anemia, though there is a possibility that they may result from cardiac incompetency; this event is so unusual that their presence demands explanation.

5. The systolic blood-pressure is almost never above normal, but tends to be below the lower limit of normal; the diastolic

pressure is disproportionately low and the pulse pressure high.

6. The urine is usually of a fairly low specific gravity, rather increased in quantity, and rarely contains albumin. The presence of albumin is not to be accepted as a usual finding in pernicious anemia; its presence with casts means nephritis, which may be the cause of the anemia rather than the effect.

7. Pernicious anemia is characterized by an irregular temperature, which is not often above 101° ; there are often recessions to normal of variable duration.

8. Achylia gastrica is so much the rule that the presence of free HCl may justifiably raise a doubt as to the diagnosis.

9. The Wassermann reaction occurs infrequently in pernicious anemia. In 46 cases there was a percentage incidence of 6.5; the general run of cases in a large charity hospital would probably show a higher percentage. It is possible that certain changes in the blood incident to the disease interfere with the reaction.

10. The gradual decrease in the leucocyte count, especially in the relative and absolute number of polymorphonuclears, is of serious prognostic import. The diagnosis of pernicious anemia should be made with the utmost reserve in the presence of a leucocytosis.

11. The negative spinal fluid tests in the presence of well established cord disease point to a toxic degenerative process in the cord rather than an inflammatory process. Disease of the cord, with pernicious anemia, usually means an involvement of the lateral and posterior columns, a combined cord lesion. The presence of evidences of cord disease is of unfavorable prognostic import; the prognosis in these cases is grave, out of proportion to the blood findings as compared to the cases not so complicated. These patients are less likely to live long enough to develop advanced grades of anemia.

12. Transfusion of blood will not cure but will often prolong the patient's life. The severe reactions which occurred in his

series were likely the result of imperfect technique; the procedure has really been developed from its inception in the years covered by this study; transfusions are now being done with a much lower percentage of reaction. Yet the experiences noted here may have a valuable lesson for us. The transfusion of citrated blood is a simple procedure, but not a harmless one. Before the operation is undertaken the bloods of donor and patient must be demonstrated to be compatible by an acceptable and approved technique.

Scopolamine-morphine Narcosis in Labor, Called Twilight Sleep.

In the *Indian Journal of Medicine* for October, 1920, DAS reviews his further experience of 34 cases from 1918 to 1920 of normal labor conducted under scopolamine and morphine narcosis, which shows that the method is valuable in suitable and selected cases.

He states that the selection of cases should rest with the obstetrician and the treatment should not be dictated by the patients.

Those who have had the largest experience of scopolamine-morphine in obstetrical practice say that the method should be used only by the obstetric specialists.

Although some authorities hold different views, the author's present opinion is that the physician must be in constant attendance on the patient. He does not mean that the doctor should be at the side of the patient during the entire period of labor, but that he should be either on the premises or ready with his motor and telephone waiting in his house. The fact of having to be in constant attendance is a great obstacle in making the administration of these drugs popular in private practice.

Doctors in private practice have very frequently a number of responsible cases all at the same time in their hands, and if they were to devote their time and attention entirely to one particular case, the other cases would be neglected. Even if this

could be done it would mean a heavy fee, which may deter the average patient of moderate means from undergoing the process of painless childbirth.

Further, a physician by confining himself entirely to a single case would be depriving the public of his services for the time being, more so if he is a specialist, in which case his services might be valuable for another patient to save his or her life. Hence he thinks that hospitals, private clinics, and nursing homes with resident doctors are the most suitable places for such cases. If however a case of this nature is conducted in a private house there must be a competent qualified assistant especially trained for this purpose to help the attending physician. The administration of the drugs should not be left in the hands of a nurse whose indiscriminate use of them or unintelligent application of them according to the routine charts might cause serious consequences. He always injects the drugs himself in his own cases.

Under these conditions he believes we have a method which without appreciable influence on the labor or without danger to the mother or harm to the child does away with the apprehension of pain during childbirth either entirely or to a very large degree.

A woman has certainly a right to demand from her physician alleviation of her pain, and there is no reason why we should not follow the via media between the two extremes and use the drugs scopolamine and morphine at their true pharmacological value, if the occasion arises.

End Results of Tonsillectomy.

In the *Archives of Pediatrics* for December, 1920, VIETOR concludes:

1. Tonsillectomy and adenoidectomy in well-chosen cases, performed by general surgeons, in a general service, under proper conditions, show 97 per cent symptomatically good results.

2. The complications arising either early or late are few and not severe in character.

3. The benefits arising both in simple

cases and those in which tonsils act as a portal of entry warrant their removal.

4. The dangers of the operation are almost *nil*, as shown by the fact that there were no deaths due directly or indirectly to the operation in this series of 500 consecutive cases.

Sodium Bicarbonate Tolerance in the Toxemias of Pregnancy.

In the *Lancet* of December 18, 1920, WHITE states that Sellards concluded that a tolerance of over 10 grm. of sodium bicarbonate without the urine becoming alkaline forms a test for the presence of acidosis, which he defines as "an impoverishment of the blood and other tissues in fixed bases or in substance which readily give rise to fixed bases." To see the clinical value of this test it is useful to enumerate the methods by which the existence of acidosis has been demonstrated. These may be divided into laboratory tests and clinical methods.

1. *Examination of alveolar air for lowering of CO₂ tension*: This is not especially difficult with the proper apparatus, but the tension is also lowered in cardiac and pulmonary diseases.

2. (a) *Examination of the blood for lowered CO₂ tension*: This gives practically the same result as "1," but is more difficult. (b) *Examination of the blood for lowered alkalinity*: (1) By titration with phenolphthalein after removal of the protein; (2) physicochemically by measuring the increase of the hydrogen-ion content. Neither of these methods is really satisfactory, as the blood reaction is kept nearly constant at the expense of the reserve of alkalis, and no change in the hydrogen-ion content is demonstrable till the patient is moribund.

3. *Examination of the urine*: (a) For excess of Na, K, Ca, and Mg salts of the normal and abnormal acids; (b) for other changes in the fixed bases; and (c) for increase in ammonia. All these involve chemical analysis and are not wholly reliable; for example, increase in ammonia

occurs in cases of faulty protein metabolism and acetone, etc., in simple starvation.

1. *As to clinical methods:* Dyspnea characterized by deep respiration with prolonged expiration without cyanosis. This is only seen in very advanced cases.

2. The presence of a fruity smell in the patient's breath. This is chiefly noted in cases of faulty carbohydrate metabolism.

3. Increased tolerance to sodium bicarbonate.

Of the above six laboratory and clinical methods it seems that the bicarbonate test is demonstrable earlier than even the alveolar-air test and much sooner than the others become positive. Hence it appears that by the simple process of bicarbonate feeding we are able to prove the presence of acidosis sooner and more surely than by the most elaborate physicochemical methods of the laboratory.

The question now arises as to how far the above facts—that is, bicarbonate treatment of and test for pregnancy toxemia—can be usefully applied to the conditions that come before us in connection with the toxemias of pregnancy. Sellards appears to have paid but little attention to such cases; he worked almost entirely on nephritis and diabetes. As pregnancy toxemias are commonly associated with more or less marked nephritis, it is important to note that uncomplicated cases of parenchymatous nephritis usually have a bicarbonate tolerance of under 10 grm. Therefore, from a rough clinical point of view, it may be taken that, in a case of pregnancy toxemia with a large bicarbonate tolerance, less than 10 grm. need be deducted as possibly due to the nephritis, and the rest will represent about the measure of the acidosis due to coexisting lesions.

White has been interested in the subject of sodium bicarbonate in acidosis since the recovery of a patient apparently in diabetic coma, after an intravenous injection of a solution containing 20 drachms of bicarbonate. Subsequently he has used it in most forms of toxemia of pregnancy as a method of treatment, but it is only in the last year that he has employed Sellards's method as

a means of diagnosis and prognosis. The crude simplicity of the method is so extreme that one instinctively feels that there must be something wrong with it; but so far as his experience goes it has apparently been a valuable guide. The patient is given measured quantities of sodium bicarbonate at fixed intervals, and her urine tested by litmus paper before each dose is given. The amount given when the litmus is first turned blue is noted, and further doses stopped till the urine is again acid. If there is ammoniacal cystitis the urine should be boiled in a test-tube to drive off ammonia before testing, or, less accurately, the litmus paper itself may be heated. He has found it safer to order the soda in drachm doses (as nurses are liable to make mistakes when working in grammes), and he has usually given one drachm in water every three or four hours. No complaint of gastric disturbance has been made. Some 50 toxemic cases of various kinds have had their tolerance so tried.

Protozoal Dysentery and Benzyl Benzoate.

HAUGHWOUT, in the *Philippine Journal of Science* for June, 1920, which has just appeared, in summarizing his article on this subject states that a case of acute balantidiosis, complicated by infections with hookworm and trichuris, was treated with benzyl benzoate.

At the time treatment was started, twenty-three days after the onset of the disease, the patient was exhausted and apparently near to death.

The abdominal pain and tenesmus, associated with the dysenteric process, disappeared within twenty-four hours after treatment was started and did not return again, even after treatment was stopped twenty-four days later.

The parasites showed a tendency to diminish in numbers in the feces until the eighth day following the institution of treatment, when they suddenly appeared in the stool in immense numbers. On this

day the stool was feculent, but contained mucus. No demonstrable tissue elements were found. He is inclined to regard this as the expression of a wholesale exodus of the ciliates from the tissues.

He believes that, had the patient not been under treatment, this "swarming" of the parasites would have been accompanied by pain, tenesmus, and the other symptoms constituting the dysenteric complex.

That the patient did not exhibit the symptoms that ordinarily accompany the departure of such large numbers of parasites from the tissues is, he believes, largely due to the selective action of benzyl benzoate. This drug, as Macht has shown, acts in a manner similar to papaverine, in that it tends to inhibit peristalsis of smooth muscle organs, and lowers their tonicity and relaxes their spasm.

The Food Requirements of Children.

In the *American Journal of Diseases of Children* for January, 1921, HOLT and FALES, in summarizing their article on this subject, state:

1. In calculating the total caloric requirements of children there must be considered separately the component parts of which the total is made up. These are the requirements for basal metabolism, for growth, for muscular activity, and the food values lost in the excreta.

2. The basal requirements, which have been determined by Benedict and Tablot, are highest per kilo at about nine months and steadily fall from this time up to adult life.

3. The food value normally lost in the excreta is a nearly uniform proportion of the intake, about 10 per cent, for all ages after infancy.

4. The requirements for growth are greatest during the period when growth is most active, namely, during the first year of life and during adolescence. They are nearly uniform from the fourth to the tenth or eleventh years.

5. The average for three factors—basal,

growth requirements, and food values lost in excreta—are nearly uniform for children of the same weight living under similar conditions.

6. The requirement for activity is the only factor which varies widely with different individuals.

7. The great differences in the calculations of different writers who have estimated theoretical values for total calories per kilo for children are in part due to the fact that they have not sufficiently considered the different component parts which make up the total.

8. The average caloric requirement of children according to their observations is about 100 calories per kilo at an age of one year (about 9.5 kilos). For boys it falls to about 80 calories at six years (about 20 kilos) and remains practically constant at this value up to the age of fifteen years, the increasing requirements for activity being met by the reduction in basal requirements per kilo. After a weight of 50 kilos (about fifteen years) is reached the calories per kilo can rapidly be reduced to adult standards, about 48 calories per kilo. The requirement for girls falls to 76 calories per kilo at six years (about 20 kilos), and continues at this value until the tenth year. During the tenth year it rises because the basal requirement is nearly constant while there is an increase in needs for growth and activity. The requirement remains at 80 calories per kilo until growth is complete, then falls rapidly to adult standards, about 44 calories per kilo.

9. In their calculation they have allowed a much higher value for calories per kilo during adolescence than have others. This seems to be absolutely essential, because of the increased growth needs at this time and the large requirement for muscular activity.

10. According to their allowance the total daily caloric requirement of children of both sexes during adolescence exceeds by nearly 1000 calories the requirements of the adult man or woman of moderate activity.

11. Children who are under weight require more calories per kilo than those who are of average weight for their age. Chil-

dren who are over weight require fewer calories per kilo than those of average weight.

12. The schedule here proposed is a tentative one and is based on present knowledge, which is in many respects incomplete. There are a number of points which must be studied more fully before definite standards can be established.

For the many reasons which they have discussed, it seems the right procedure to

allow for children during the period of adolescence more calories than the adult ration, and, as growth needs end, to diminish the caloric allowance to the adult standard. They quite agree with Benedict's recent statement, "It is still, however, the best practice to give a most liberal diet to children, since the greater part of the evidence on under weight indicates that children usually receive too little rather than too much food."

Surgical and Genito-Urinary Therapeutics

Crucial Points in Surgery of the Gall-bladder and Ducts.

CRILE (*New York State Journal of Medicine*, October, 1920), basing his paper on an experience of 1325 operations, observes that the minimizing risk due to pathologic hemorrhage is readily met, for it is almost specifically controlled by the transfusion of blood.

As a rule the best exposure in common duct operations is secured, not by a vertical incision, but by an incision that parallels the costal border dividing the muscles obliquely. This gives a direct and wide exposure of the liver, gall-bladder, and ducts; moreover, it has one of the advantages of Mayo's transverse incision in ventral hernia, *i.e.*, it does not divide so many nerve fibers, and it provides a greater security against postoperative hernia.

Of prime importance is the length of the incision. The incision must be sufficient to secure an absolute and adequate exposure of the operative field.

In cholecystostomy there is no special problem in drainage; but in cholecystectomy the method and position of drainage is open to question. It is an axiom that the best drainage is dependent drainage, which is frequently best secured through a counter incision at the bottom of Morrison's pouch. In fact, in cholecystectomy, the question of drainage is paramount, for if it is not adequate a subphrenic abscess may be

established. If adequate dependent drainage is not established through Morrison's pouch, then it must be ample through the abdominal incision, so that by no chance will there be an accumulation of fluid at any one point which may be dispersed by the respiratory movements. In fulminant cases of cholecystitis, the only immediate procedure as a rule should be the establishment of gall-bladder drainage. It is very desirable to carry the acute gall-bladder over to the subacute stage before the final operation. After the acute symptoms have subsided and the temperature has remained normal for a period and the patient's general condition has become stabilized, then a cholecystectomy may be performed.

In the preliminary operation in a grave risk, the adhesions should be separated only sufficiently to meet the absolute requirements of drainage. In these fulminant cases as soon as the gall-bladder is opened a tube is inserted and nothing more is done surgically. Around this tube a quantity of iodoform gauze, well wrung out, is lightly packed, and beyond this an abundance of gauze is inserted around all the sides of the short abdominal incision. No stitches are used provided the incision is short and the gauze packing adequate.

After the removal of a stone from the common duct, provided bile drainage through the ampulla or the gall-bladder is assured, the entire duct lumen may be

closed with fine chromic gut, just as wounds of the intestine are closed.

On the other hand, drainage of the common duct is required:

If there has been a stone in the ampulla; if the duct mucosa has been so injured as to cause hemorrhage; if there is a probability of postoperative closure of the duct by swelling.

In cases in which drainage of the duct is not required and the duct is sutured, a drain is placed near, but not against, the line of suture.

An examination of the postoperative course of any series in which drainage alone is used routinely in all gall-bladders, irrespective of the condition of the gall-bladder and the cystic duct, will show in some cases a temporary quiescent period followed by fever and pain, and a sense of pressure and burning in the scar, which has reddened, become swollen and tender, and finally opened to allow the escape of muco-pus or bile or both. The symptoms then disappear and the wound closes, but the same cycle tends to reappear after a longer or shorter period.

It does not satisfy or content the victim of this cyclic gall-bladder to assure him that this is a safety-valve, that little or no danger attends it, and that some day it may get well.

Such cases present to us the following definite clinical problems: Can it be determined at the time of operation whether a given case will eventuate in this malevolent cycle? Is cholecystectomy followed by any unfavorable after-effects? Will the mortality rate of cholecystectomy be greater than that of cholecystostomy in the cases that will be followed by the cycle of cholecystitis, eruption, quiescence?

From the local conditions one can with accuracy forecast the clinical behavior of the gall-bladder and the cystic duct. We are bound to admit that the gall-bladder has a function; and that in the absence of the gall-bladder the common duct is dilated; that a dilated common duct partly compensates for the absence of the gall-bladder by storing bile; and that the abnormal storage

of bile in the common duct predisposes somewhat to the formation of stone in the common duct.

Experience has taught that if the mucous membrane of the gall-bladder is gangrenous; if there is chronic infection of the gall-bladder; if there is a stone embedded in the cystic duct; if the wall of the cystic duct is thickened; if the wall of the gall-bladder is thickened by scar tissue as a reaction to infection—then mere drainage of the gall-bladder, usually though by no means always, will be followed by recurrent obstruction and infection, and in these cases cholecystectomy is recommended. On the other hand, if the gall-bladder has approximately normal walls, and if the cystic duct is approximately normal, then no matter what the size or the number of stones, if the operation is performed with due care there will be rarely if ever a postoperative pathologic cycle.

In cholecystectomy the following points may be emphasized: The gall-bladder should be exposed by an ample incision so that there is free access to the base of the gall-bladder; the freeing and separation of tissue should be made by sharp dissection, care being taken not to injure the liver even slightly, so that oozing of blood and bile as well as infection may be avoided. The entire gall-bladder should be freed from its attachment so that ample opportunity may be given for determining the exact place at which the gall-bladder ends and the cystic duct begins, the division being made just proximal to this point. The cystic artery should be isolated and tied separately.

It is well to emphasize further the necessity of most careful determination of the exact point at which the division should be made between the gall-bladder and the cystic duct.

The clinical results of cholecystectomy in many cases of pathologic gall-bladder are clinically as much better than cholecystostomy as nephrectomy of a pus-riddled kidney is better than a nephrotomy. The convalescence after cholecystectomy is usually as uneventful as is convalescence

after a salpingectomy for chronic suppuration.

The magnesium sulphate test is based on the fact that contact of the duodenal mucosa with a partly saturated solution of magnesium sulphate causes a relaxation of the sphincter of Oddi, and the subsequent discharge of sharply differentiated types of bile, always three in number in normal cases, which are believed to come in successive stages from the common duct, the gall-bladder, and the liver itself.

The technique is as follows: The patient is given a duodenal tube to swallow and the stomach contents are aspirated for a routine examination. When this is done, the patient is turned on the right side, and a pillow placed under the hips. He is then instructed to massage the epigastric region from the left to the right until further instructions are given. To relax the pyloric sphincter and thus facilitate entrance to the duodenum, benzyl benzoate is given immediately after the tube is swallowed.

When it is ascertained that the duodenum has been reached, usually in from three-quarters of an hour to an hour, a solution of 60 Cc. of a 25-per-cent solution of magnesium sulphate is injected through the tube into the duodenum. The tube is then clamped, and after three or four minutes preparation is made to collect the specimens of bile. On removing the clamp from the tube a flow of fluid is expected, usually with no preparatory aspiration. This back flow consists of a drip or return of part of the magnesium sulphate injected into the duodenum. This changes to the "common-duct phase"—bile of the consistency of a thin syrup. After 5 to 10 Cc. of bile of this consistency have been cleared a definite change is noted, which indicates the "gall-bladder phase"—bile of a thicker, more ropy consistency, and of a dark color, the amount of which may vary from 25 to 100 Cc. The character again changes to the "liver phase"—in which the bile is of a lighter, straw color, and much more fluid in consistency. These changes are quite definite and abrupt.

Regarding the application of the test

Crile states that the duodenal contents are normally clear and faintly bile tinged. A cloudy fluid from the duodenum means nothing if it is intermittently cloudy or acid, or if upon microscopical examination it is found to contain stomach elements. When the gall-bladder phase is absent obstruction of the cystic duct is suggested. Usually the bile from the normal gall-bladder is prompt in making its appearance, coming in from two to six minutes after the injection of the magnesium sulphate solution. In eight cases the diagnosis of obstruction of the cystic duct previous to operation has been made by the magnesium sulphate test. These cases all showed an obstruction of the cystic duct at the time of operation.

As to death from "liver shock" following operation the common causes of this condition are ether anesthesia, suboxidation from deep and prolonged anesthesia, trauma, and low blood-pressure. The use of a local anesthetic coupled with light gas and oxygen anesthesia, minimum trauma, secured by an ample incision, by sharp knife dissection, and by as brief an operation as is consistent with good surgery, blood transfusion if the blood-pressure is low, and morphine in case of pain, obviate or minimize these causes. In addition the activity of the liver cells is increased by the application of local heat, and by abundant water—to this end large hot packs are used and adequate water equilibrium is established before and immediately after operation and are continued through the acute postoperative phase.

Hidden Sepsis.

ROBERTSON (*Lancet*, Nov. 20, 1920) states that we must think of hidden sepsis as the unknown determinative agent or symptom whose urgency or intractability affords no obvious clue to the exact nature of the underlying chief factors. And this because, until our examination has revealed the specific nature, source, and site of the infection, we cannot tell whether it will prove to be, on the one hand, a successful

attack by bacteria or mycelial or protozoal agencies, or, on the other, a breakdown in the natural defences against any infective agent whatsoever. Thus the conception of sepsis.

In any case our first duty as physicians must be the making of a searching physical and clinical examination of the patient himself. We must inquire very closely into his family history, his past and present environment, his conditions and habits of life, and his present symptoms and other evidences of ill-health; and, gleaned from these the multiple evidences whose value we shall have to assess as factors of the problems we are set to solve, we must bring further light to bear upon the case through those methods of laboratory research which are now within our knowledge and reach.

Apart from epidemics, no infection, however acute, or however chronic, can be adequately appreciated apart from the general standard of native resistance in the patient, since no two of us start on the long journey of life with the same heritage of immunity, and we do not equally conserve the capital with which we set forth. No physician of experience will deny the influence of soil poverty on the profusion of the weeds and briars we are accustomed to call simple ailments.

It is our common experience that at the bedside we are frequently in doubt as to the true nature of an acute or chronic infection. Again using the word in its broadest sense, it may be that we are called upon to classify a sharp pyrexial attack which, at any rate in its earlier stages, may suggest to us such widely differing conditions as pneumonia, typhoid, or cerebrospinal fever. The physical and clinical evidence at the bedside may have given us no guidance, and we are driven to adopt laboratory methods to assist us in arriving at a conclusion which must, from the first, determine our own line of action, and to some extent the prospects of recovery for the patient. Mere expectant treatment may well prove a fatal choice, and to-day more is expected of us in rapid and accurate diagnostic facility, and rightly so. Or, again,

it may happen that, in spite of long expectancy, the true nature of a continued fever remains still obscure. How shall we then in any case of this nature begin to avail ourselves of laboratory methods of diagnosis? Perhaps our first examination will be that of the blood cells, and from this we may certainly hope rapidly and definitely to reduce the number of probabilities. For, as in the first case suggested, we shall find that in an early stage of one of the enteric group of fevers there is a definite leucopenia at the expense of the polymorph cells, whereas in a typical croupous pneumonia, and in cerebrospinal fever, there is an equally definite leucocytosis, in which the polymorphs reach a characteristic and high percentage—88, 92, or even more. The leucocytosis of such a pneumonia does not often rule higher than 16,000 to 18,000 cells per c.mm., while that of cerebrospinal fever may reach a figure almost twice as high.

In the second group of more chronic continued fevers we are, as a rule, in the presence of one of three dominant infections, and it becomes a question whether we are dealing with one of the coli-typhoid group, with a chronic streptococcal infection, or with, what is so often called in the absence of the tubercle bacillus itself, "latent tuberculosis." Now there are three useful guides in such a case which will together point to the presence of any particular one of these. If the case be one of enterocoli infection we shall find in the urine unmistakable evidence of intestinal putrefaction of protein. This can be recognized in the presence of end-products of the amino-acid derivatives, such as indican, indol, and tyramine, and of the purin bodies in the xanthoproteic reaction. The diazo-reaction will be positive. The type of anemia found in the blood picture will also be characteristic, since in the constipational stages there is the usual leucopenia with relative lymphocyte increase, a primary reduction of the hemoglobin followed later by a reduction of the total red cells, and a progressive if slight drift to the left in the Arneth index.

Even at this stage the large mononuclear percentage is increased. The temperature chart shows a very characteristic morning reading, just below or just above 97° F. The feces in the Gram-stained smear do not show any marked increase of Gram-positive elements. The blood-pressure is low.

Contrast with this the blood picture in chronic streptococcal infection. This, except in the case of an occasional markedly hemolytic strain, shows a tendency to a high reading of the hemoglobin and color-index, and the leucocytes are normal in number, or reach perhaps 9000 to 10,000 per c.mm. The Arneth index is normal, for the toxin does not appear to inhibit but rather to stimulate the production of polymorph cells. The invasion of the submucosal tissues of the colon gives rise to a characteristic antiseptic response on the part of the large mononuclears, and those are generally found to be not less than 10, and frequently as high as 16 and even 19 per cent in the differential count. The temperature chart shows a more wave-like tendency as the exacerbations develop, but on the whole the morning-evening variation is not more pronounced than in the typho-coli group just described. There are, however, two points in the chart which should immediately challenge attention. These are, first, in the typho-coli group the pulse-rate is not markedly accelerated—*i.e.*, it rarely exceeds 90—whereas in the chronic streptococcal infections it is rarely below 90 in the morning and generally reaches 100 to 105 in the evening; secondly, in the typho-coli group the morning temperature is generally below or just above the 97° line; in the streptococcal group it is rare to find a single record below 98°.

The blood-pressure is also higher and generally registers, in young adults with streptococcal infection, 140 mm. or more.

Clinically, it is generally easy to separate these two infections. With the coli group one learns to associate the muddy skin and the pigmentation, which are eloquent of the toxic involvement of the suprarenal glands. There are chilliness, coldness of extremities, habitual constipation, furred tongue,

and the many other common stigmata of adrenal and thyroid inadequacy.

With chronic streptococcal infection we have the clear pink-and-white complexion, the mental and psychical acuteness and hopefulness, which contrast so strongly with the depression and fatigue of the other. This has often misled the examiner to a conviction that he is dealing with a case of latent tuberculosis; but tubercle does not account for the repeated sore throats, the periarticular and aponeurotic expansion fibrositis, and the neuritis and marked dysmenorrhea, which are such constant finds in the subjects of chronic streptococcal dissemination.

This brings us to a consideration of chronic tuberculous infection, which the author has for a good many years held to be a secondary infection of low intrinsic value, parasitic in its nature, which can, apart only from actual inoculation, obtain and maintain a footing in tissues already chronically intoxicated and reduced as regards their naturally high immunity to it by one or other of the three great master toxins. These are: chronic intestinal stasis, malaria, and syphilis, although shock, chronic alcoholism, and certain other markedly neurodepressant agencies may act in the same way. The great master toxin in tubercle is to be recognized in the chronic coli infections met with in intestinal stasis. We shall never successfully root out tuberculosis from the individual or from the community until we have first of all eliminated the prime toxic influence.

When the blood picture in the coli infections of chronic stasis shows a marked reduction of both hemoglobin and total red cells, concurrently with a marked drift to the left of the Arneth index beyond the usual limit reached in simple coli intoxication, we have a right to assume that the advent of tubercle is either imminent or an accomplished fact. How great is the subverting influence of this chronic coliform intoxication is illustrated daily in our experience when we find in just this class of cases infection by staphylococci, which,

in defiance of our efforts with vaccines and colloidal therapy, refuses to clear up, so that patients are known to us all who have suffered from boils more or less constantly and severely for years. In three cases—one of "golf elbow," one of chronic iridocyclitis with obscured vision, and one of recurring fluid in the knee-joint, thought to be tuberculous—the author has been able to demonstrate in the urine and in the flora of the upper colonic area streptococcal organisms from which vaccines were prepared, with in each case resulting disappearance of the symptoms.

Umbilical and Ventral Hernia.

WARREN (*Lancet*, Nov. 20, 1920) states that hernial protrusions through the abdominal wall other than through the inguinal and femoral rings fall into two main groups of prime importance: (1) umbilical hernia of adults; and (2) ventral, incisional, or postoperative hernia. Of these two classes together the author has operated on 84 during the past ten years. The other types of ventral hernia from their relative infrequency form a far less important group, viz.: (a) fatty hernia of the linea alba; (b) exomphalos of the newly born; (c) umbilical hernia of infants and small children, due to stretching of the umbilical cicatrix.

Forty-nine adult umbilical hernias were operated upon, with a 25-per-cent mortality in the strangulated cases, and 33 per cent when gangrene was present. This mortality was due to delay in adopting operative procedure.

As far as suturing the hernial orifice is concerned, this is based on the plan of Mayo, the underlying principle of which is the fact that the oblique and transverse abdominal muscles are inserted into the linea alba, and when they contract tend to pull the latter apart. The result of this is that if an aperture in the linea alba be closed vertically the effect of coughing and straining is to pull the hole open, while if the latter be closed transversely the result-

ant pull of the oblique and transverse muscles pulls the sides of the opening closer together and makes it more slit-like than before. Another important point is to commence the operation as if with the object of cutting the hernia right off, not of opening it; that is to say, one aims to open the hernia at its neck, close to the exit of the latter from the abdominal wall, because here there are seldom any adhesions and the interior of the sac is easily attained. To cut down on the fundus of the sac is sheer waste of time; the surgeon is apt to find difficulty in opening the sac, and to get badly confused with adherent omentum and bowel. A great part of these hernias, consisting of omentum, sac wall, and a goodly flitch of overlying fat around the hernial protrusion, can be and should be cut off.

A large ellipse with pointed ends, which extends some inches beyond the hernia on either side, in the case of large hernias well out on the flanks, is marked out and carried down to the abdominal wall—i.e., to the rectus sheath and aponeurosis till the neck of hernia is reached. Plenty of aponeurosis should be stripped bare of fat, so that when the layers of rectus sheath are overlapped transversely a good firm union is obtained, which would not be the case if any fat were left to intervene. The tissues forming the neck of the sac are divided carefully into the cavity of the sac all round, flush with the abdominal wall.

When the neck has been divided all round we can pull to one side the whole hernial mass still adherent to the interior of the abdomen by the gut and omentum which enter it. The opening of the hernia into the abdominal cavity is blocked with a pad of gauze, in case there is infective fluid in the sac (as in cases in which the gut is gangrenous), which might flow back into the abdominal cavity with disastrous results. We can now deal with the hernia fairly easily; the sac is opened from the neck toward the fundus, and the gut freed and returned if viable. It is generally pretty obvious at this point if the contents of the sac are gangrenous, in which case we apply intestinal clamps to the pedicle

of the mass (consisting of gut and omentum) and cut the gangrenous mass away *en bloc*. It is well to place crushing-clamps on to the omentum distal to the intestinal clamp to prevent its slipping back through the latter and causing serious hemorrhage. The cut ends of intestine are anastomosed (preferably by the end-to-end method), the vessels in the cut omentum carefully tied off, and both returned to the abdomen. The above description applies especially to the strangulated forms, but can equally well be used in quiescent hernias. In most instances the small intestine can be freed easily and returned unless gangrenous. The transverse colon, drawn into the sac by the exuding and adherent omentum, may present more difficulty. To deal satisfactorily with the omentum the finger is run round the margin of the hernial aperture inside the abdomen, and the omentum pulled down to where it is quite free from adhesions to the sac or abdominal wall and is tied off in fairly large masses. Interlocking ligatures are not needed if care be taken to include all the larger vessels in the ligatures and to cut off the omentum at least an inch beyond the ligatures to prevent its slipping through.

Two to four mattress sutures are introduced into the lower edge of the aperture in the linea alba and their free ends passed from behind forward through the upper border of the aperture 2 inches from its edge. When all the mattress sutures have been introduced they are pulled tight and tied on the outside, thus causing the lower edge to overlap the upper edge internally by two inches. The free edge of the upper margin is then sutured to the aponeurosis, two inches below the edge of the lower margin, rendering clear the necessity for widely removing fat around the neck of the sac. The skin is drawn together with a few interrupted sutures passing deeply to obliterate the dead space which otherwise would occur in fat subjects, and the superficies closed with a continuous suture. On one occasion the hernia was so large that it was only with considerable difficulty that the last two feet of intestine were induced to retire within the abdomen; the patient after opera-

tion had a very severe attack of bronchitis lasting several days, but without effect on the operation scar. These facts speak for the efficiency of the transverse closure.

Seven cases could be traced; of these three were alive and without recurrence two, three, and five years respectively after operation. One case died six months after operation, the cause being uncertain. Two cases died of bronchitis five and seven years after operation without recurrence, aged respectively 59 and 76. One case showed a small bulge in the scar five years after operation. Considering the age and condition of these patients, we can expect as a rule quite satisfactory results and absence of recurrence for a number of years.

In the group of postoperative or incisional hernias were 35 cases, 13 following appendectomy through a gridiron (muscle-splitting) incision; 22 were sequelæ to median or paramedian laparotomy. In each group was one herniotomy for strangulation, and in the whole group there was but one excision of intestine, not for gangrene, but for extensive matting and kinking in the scar. The average age was 35 and there was no mortality; the cases in this group are obviously of a less severe type than are those of the last discussed.

For middle-line hernias the Mayo method was employed whenever possible — i.e., where the opening in the abdominal wall was fairly circular; when the opening was elongate in the long axis of the abdomen, the edges were freed, the rectus sheath dissected up widely, and suturing with overlap practiced; sometimes a filigree was inserted. Where the hernia was through a gridiron appendectomy wound the edges of the various layers of aponeurosis and muscle were exposed by a free dissection and the abdominal wall reconstituted in its normal state, usually with some overlapping of the external oblique aponeurosis. The main point in the technique is to dissect very widely from the hernial orifice, so that the muscular and fascial layers are all well recognized and thoroughly exposed in the whole extent of the hernia. To do this will often require a 6- to 8-inch incision and the

stripping back of skin and fat for several inches.

Seventeen cases were traced. Of these, seven followed median and paramedian laparotomy; all were in good condition, two after two years, two after six, two after seven, and one after eight years respectively. The only poor results in this group were those in which the hernia had followed the low right rectus incision done by other surgeons for appendectomy. Of these there were two cases, both with a large bulge in the scar after four and five years respectively. Of seven cases arising after the gridiron incision for appendectomy five were perfect, one five, one six, and three seven years after operation. Two cases showed a slight bulge or very small central aperture five years after operation. These cases, though rather few in number, have some bearing on two rather interesting questions: (a) The relative merits of the gridiron and the low right rectus incision with the rectus displaced inward (Battle incision); (b) the use of silver-wire filigree.

Modern Treatment of Syphilis of the Nervous System.

MEHRTENS (*California State Journal of Medicine*, November, 1920) calls attention to the fact that irritation, no matter of what nature, whether by the individual's own serum, true inflammation, or even in a less degree by lumbar puncture, all tend to lower the barrier between blood and spinal fluid. Sodium iodide which normally cannot be caused to pass the choroid plexus, even by intravenous injection of two hundred grains, can readily be made to do so following a preliminary injection of blood serum.

Reiger and Solomon found that salvarsan injected intravenously appeared in the spinal fluid in 30 per cent of the cases.

The author notes that about 40 per cent of his cases of cerebrospinal syphilis improved markedly, subjectively, serologically, and in the increased capacity for work, under intravenous and intramuscular

treatment. It seems, then, safe to assume that permeability of the choroid plexus to antiluetic drugs occurs naturally in certain individuals, and for these cases the intravenous and intramuscular treatments are quite satisfactory.

Mehrtens irritated the meninges of 100 patients with their own blood serum. After an interval of six hours 0.6 gramme of arsphenamine was given intravenously. The amount of arsenic in the spinal fluid was estimated. The results show that arsphenamine given intravenously penetrates the meninges in 40 per cent of cases. Complete drainage of the spinal fluid did not increase the number of penetrations. Preliminary irritation of the meninges caused intravenous arsphenamine to penetrate in 90 per cent of cases and in three times as strong a concentration.

On the basis of these results the author has applied this treatment to one hundred and fifty cases of syphilis of the central nervous system. The results are slightly more satisfactory than in Swift-Ellis' or Byrnes' treatments in the amelioration of clinical symptoms, clearing up of the serological findings, and freedom from relapses or complications. The treatment should only be made in the 60 per cent of cases in which the membranes are impracticable, and even in these there may be certain contraindications. Even drainage causes some meningeal irritation, as well as some vasomotor dilatation, as indicated by the pleocytosis of ten cells following the puncture.

Every one working with cerebrospinal syphilis has noted cases which as results of previous treatments, or because of naturally fine veins, present an impossible subject for further intravenous treatments. The rectal administration of arsphenamine has been used clinically for some time. The dose is relatively small, and while traces of arsenic were found in the blood and urine, a constitutional effect was not achieved. By gradually increasing the dose the author is now using 0.4 gramme of neoarsphenamine in the thoroughly irrigated rectum. He has traced it through the blood and into the

spinal fluid when the meninges were irritated. The usefulness of this method is obvious, and the author hopes to report a type of case in which this is the treatment of choice even with intact veins.

The clinical results of 1500 treatments for syphilis of the central nervous system, given in the last three years in the neurological service of Stanford University Medical School, have brought out the following facts:

To get the maximum results, each case must be treated according to individual requirements—there can be no rigid routine treatment.

There is no greater danger in treating syphilis of the central nervous system than there is in treating visceral lues when a proper technique is developed.

Cerebrospinal syphilis (meningeal type) was arrested in 80 per cent of cases; intramuscular and intravenous therapy were sufficient in about 40 per cent. Of the remainder 35 per cent were benefited by intraspinal therapy, and 15 per cent were improved somewhat but not arrested. About 5 per cent of cases diagnosed cerebrospinal lues developed paretic symptoms. Headaches cleared up in 90 per cent of instances—generally after one or two intraspinal treatments.

Tabes—early cases—nearly all did well clinically. Some lightning pains recurred from time to time.

Later tabes showed marked improvement in about 60 per cent, but there was no evidence to show returning function of reflexes—pupillary reaction or Romberg sign. There was sufficient improvement to send most of this class back to work.

In paresis the results were poor. A few cases went into remissions, but ultimately deteriorated and had to be committed. Several cases so diagnosed cleared up permanently, but this unusual result tended to make the author doubt the original diagnosis. It does not emphasize the benefit for a doubtful case of paresis.

It may be said that our present methods of treating neurosyphilis are by no means so successful as we would like to make

them. Certainly the last word has yet to be said, particularly in the development of the intradural methods. Even so, we can feel that our present methods enable us to arrest cases intractable to the older ways and give us hope that the future will evolve methods which, used in time, will arrest a large majority of cases of neurosyphilis.

The Early Diagnosis of Carcinoma of the Oral and Laryngeal Pharynx.

DAVID (*Journal of Laryngology, Rhinology, and Otology*, November, 1920), after emphasizing the importance of the earliest possible diagnosis of carcinoma of the pharynx in order that the tumor may be successfully treated by excision, observes that there are three types frequently seen by the laryngologist, namely, carcinoma of the region of the base of the tongue and epiglottis; carcinoma of the pyriform sinus; epithelioma of the postcricoid region.

His fourteen cases of carcinoma of the base of the tongue and epiglottis with one exception all occurred in men. In spite of the accessible position the growth had not been diagnosed until inoperable, and in three cases the symptoms were attributed to neurasthenia. In others the patients reported with a mass of malignant glands at the angle of the jaw and were sent to the laryngologist for a search for the primary growth. Such cases have been observed to commence as a small ulcer at three definite situations: the junction of the anterior pillar of the fauces and the tongue; immediately below the tonsil at the junction of the lateral wall of the pharynx and the tongue; in the vallecula, either on the base of the tongue or on the anterior surface of the epiglottis.

The early symptoms are persistent severe pain on swallowing, located by the patient at the root of the tongue, with blood-stained, frothy expectoration and slight enlargement of the deep cervical gland or glands at the angle of the jaw. Occasionally a chronic paroxysmal cough is the first symptom. Later the movement of the

tongue becomes limited, as shown by incomplete and painful protrusion of this organ to one side, and this incomplete protrusion with the accompanying trismus impedes laryngoscopic examinations.

The growth was inoperable when first seen, in spite of the fact that it is within easy reach of the palpating finger, and does not require a skilled laryngologist or endoscopist to detect.

There were 31 cases of pyriform sinus carcinoma, all in men. The growth commenced in the majority of cases as an ulcer on the arytenoepiglottidean fold, or in others on the floor of the fossa, and sometimes even lower, on one side of the posterior surface of the cricoid, and crept upward to the pyriform sinus, involving the same side of the larynx, with fixation of the vocal cord and the characteristic edema of the false cord in that half of the larynx. In late cases the base of the tongue and epiglottis are involved, and by downward extension the lumen of the pharynx is surrounded. The first symptoms are sore throat, followed by characteristic hoarseness or roughness of the voice, with a copious frothy, blood-stained expectoration. The deep cervical glands are soon enlarged and the neighboring tissues of the neck are infiltrated. This type of case is usually inoperable at the first inspection, and any attempt at removal means a laryngectomy with excision of a large area of the pharynx.

Of the post-cricoid carcinomata there were 24 cases, 22 women and two men. This is frequently a slow-growing, superficial tumor which appears to commence on the lower portion of the posterior surface of the cricoid cartilage and well below the area seen in an ordinary laryngoscopic examination. These growths also commence in the posterior pharyngeal wall at the level of the cricoid or a little higher. In this position they are more easily seen.

These patients first complain of soreness or pricking sensation with radiating pain in the ears during swallowing. Pressure of the larynx backward against the spine or lateral movement produces pain in practi-

cally all cases. Dysphagia appears early, and when these symptoms are present without satisfactory explanation the patient should be examined by suspension laryngoscopy or by the esophagoscope. The laryngoscopic mirror will not show any signs in the early stage. When the upper edge of the growth is visible the disease is advanced. Matters are still more hopeless when the vocal cord is paralyzed. Neither is the growth within reach of the longest finger, and the passage of a bougie is valueless and even harmful. In the absence of physical signs the dangerous diagnosis of neurasthenia is still made, but such a diagnosis should never be concluded until the presence of a growth has been eliminated by direct examination.

The majority of the cases of carcinoma observed were associated with septic teeth. The removal of the septic teeth was not only a preparation for operation, but improved the patient's condition. Of the cases of post-cricoid growth, 24 in number, five were subjected to operation, but all were dead at the end of a year—two of them a few days after operation. The tumor is often superficial and of slow growth. Metastases are late.

The Treatment of Abortion.

HILLIS (*Surgery, Gynecology and Obstetrics*, December, 1920) observes that from the earliest times there has been a difference of opinion between those who advise expectant conservative care and those who insist on operative interference. In the treatment of infection of the uterus after labor at term, there has been a decided trend toward conservatism. Each puerpera who has died as a result of vaporization, the use of sharp and dull curette and uterine douche, has contributed her bit to this slow progress toward better things. Although it seems that the specialist in obstetrics is tending in the direction of conservatism in both postpartum infections at term and those in the earlier months of pregnancy, it cannot be said that this

opinion is by any means unanimous. Thus it is not true in the case of the general practitioner who, imbued with the present-day spirit of activity, feels that he must do something, and that something to him means curettage.

The problem in the treatment of septic abortion is very much like that which existed in the case of appendicitis. At first the mortality in appendicitis was high and the complications many, but with the doctrine of operation as soon as the diagnosis is made the mortality in this disease has greatly diminished. From clinical experience, not laboratory, we have learned therefore that since the cases that will get well without operation cannot safely be selected, the best results in appendicitis are secured by early operation in every case.

Analogously, since we cannot select the cases of septic abortion for a specific therapy, is it better to curette or to treat expectantly? Granting that some will die regardless of treatment, and that some are worse off if curetted and others if let alone, will a greater number receive harm by being curetted or by being let alone? This question can best be answered by clinical experience based on diagnostic facilities and skill.

The author selected a series of 100 septic cases treated actively and a series of 100 septic cases in which there was no local treatment. The cases with no local treatment had fewer days of fever, a shorter stay in the hospital, fewer complications, and a lower mortality.

He decided to run a second series of so-called non-septic cases to compare the results of active and expectant treatment in those who were fever-free, from which he concludes that all septic cases should be treated expectantly until fever-free. Only in the case of alarming hemorrhage, dangerous to life, should the uterus be emptied artificially of secundines. In the septic case no operative procedure should be carried out until the patient has been five days fever-free, at which time such a case may be regarded as a non-septic case. If such patients are septic at least they

enjoy an immunity which our clinical experience seems to show permits them to be curetted with impunity and with a possible shortening of the convalescent period. This nominal, highly-important period was determined from the author's clinical experience in the ward by six months' observation. At first curettage was done after three days of normal temperature, but in not a few cases there was an alarming postoperative rise in temperature and the patient's stay in the hospital was prolonged. Experimentation with longer and shorter periods of normal temperature in cases that had been septic showed that the five-day limit was the earliest in which uniformly good results could be obtained. The premise, mentioned above, of treating all septic cases expectantly until fever-free, was of course based upon the conclusions drawn from the 200 septic cases previously analyzed.

Cases were assigned alternately to the operative and expectant treatment lists, when the diagnosis of abortion was made. Cases on the operative list were curetted when there was profuse or persistent bleeding, or when it was evident by examination that placental tissue was retained. If the bloody discharge ceased and it was evident that the uterus was empty and abortion complete, cases on the operative lists were not curetted and notations were accordingly made to that effect. However, the latter cases, though treated expectantly, were not transferred to the list of expectant cases.

Cases on the expectant list were treated as such unless hemorrhage was very profuse or persistent, when they were curetted. Notations were made accordingly and the cases, though curetted, remained on the expectant list.

The induced or criminal group included: instrumental criminal abortions and the self-induced by catheter, silver wire, metal bougie, slippery elm, vaginal douches, quinine, etc.

In the group with associated pathology or a history of accident there was noted: fibroids uteri, retroversioflexion,

hyperemesis gravidarum, syphilis, acute bronchitis, excessive coitus, blows on the abdomen, etc.

The figures indicate that in half the cases the etiology was unknown. The percentage of 32.35 for the group of self-induced and criminal abortions is highly important, for this type of patient is so likely to be infected beyond the secundines and in or beyond the uterus that even the exponents of radical operative treatment could not hope to remove the source of infection by the curette. In addition this class must necessarily be shut out from active interference and is the group which clinical experience has shown die. These are the cases which furnish our mortality statistics almost *in toto*.

The author concludes that in a series of 200 cases of septic abortion, divided equally into those curetted and those let alone, it was strikingly shown that the cases with no local treatment (conservative) had fewer days of fever, shorter stay in hospital, fewer complications, and a lower mortality.

A six months' clinical study showed that no operative procedure should be carried out in septic cases until they are five days fever-free, when they become so-called non-septic cases.

A study of 122 cases of so-called non-septic abortions showed:

That 63.11 per cent of abortions occurred between the second and fourth months, and a history of previous abortions was secured in 35 per cent.

That 32.35 per cent of the abortions were self- or criminally induced and potentially septic.

That 61.46 per cent entered the hospital with a temperature above 98.8° F.

That while 9, or 16.36 per cent, of the 55 cases on the active list did not have to be curetted, 27, or 40.29 per cent, of the 67 on the expectant list had to be operated upon.

That five septic cases which were discharged not curetted returned because of resumption of hemorrhage.

That there was no striking difference between the active and expectant lists in average days of temperature, lochia rubra, and stay in the hospital.

That there were only two complications, and the mortality was *nil*.

Cases of septic abortion should receive no local treatment until they are at least five days fever-free; the one exception being hemorrhage that threatens life.

This nominal period converts a septic case into a so-called non-septic, which has fewer days of fever, a shorter stay in the hospital, fewer complications, and a lower mortality.

So-called non-septic cases should be curetted as a routine.

Forty per cent of expectantly treated cases have to be curetted. Curettage insures an empty uterus and prevents subsequent bleeding. It shortens the stay in the hospital. This procedure is relatively harmless in comparison with the good it accomplishes.

Surgery of the Spinal Cord Tumors.

ADSON (*The Journal-Lancet*, Nov. 15, 1920) notes that spinal cord tumors may develop at any level, but are very prone to occur most in the thoracic region. Seventy-five per cent are extramedullary and are removable; the results depend directly upon the duration of symptoms. If the growth is diagnosed early, its location serves as an important indicative factor of the surgical possibilities and of the prognosis. As a rule, extramedullary tumors are endotheliomas, psammomas, or fibromas; sometimes they are myxomas, lipomas, chondromas, osteomas, gliomas, and sarcomas. Intramedullary tumors are usually of glial origin; they infiltrate the cord, and do not lend themselves to surgery so readily as the extramedullary type. Occasionally the cord can be incised longitudinally, and a partial removal made. In a few instances marked palliative relief has been afforded.

Soft, slow-growing tumors produce very few symptoms at the onset and are difficult to diagnose; while hard, encapsulated

lesions, such as psammomas, cause pronounced symptoms, usually of the Brown-Séquard syndrome. Sooner or later there is complete loss of pain, tactile, and temperature sensibilities, of motor power, and of reflexes in the segments at the tumor level, together with defense and increased reflexes below the segments involved. Fusiform tumors do not present the pronounced level that rounded tumors do; and an impairment of sensory changes over several segments usually occurs before a complete loss is observed. The outstanding feature in the diagnosis of spinal cord tumors is the slowly progressive loss of motor power in conjunction with the loss of pain, tactile, and temperature sensibilities, and exaggerated reflexes below the tumor level, different from those in myelitis, which is associated with a rather rapid development of motor and sensory loss. There is, however, the exception of chronic myelitis, in which the trouble develops similarly to that of cord tumor and produces motor and sensory changes. Horsley and Elsberg have referred to this condition as meningo-myelitis. In some cases surgical treatment appears to be beneficial, but there is a question in his mind whether much actual improvement is ever obtained. Unfortunately, it is impossible definitely to differentiate these conditions in advance of exploration, and, if only patients presenting all of the symptoms of spinal-cord tumor were accepted for operation, a certain group of growths simulating chronic meningo-myelitis would necessarily be barred.

In the Mayo clinic 62 patients have been operated on—23 up to 1916, and 39 during the past three and one-half years.

In the group of 23 patients complete removal of the tumor was effected in 5, partial removal in 4, and in 9 a tumor was not found.

In the group of 39 patients complete removal was effected in 20, partial removal was effected in 8; the tumor was not removable in 6, and in 5 a tumor was not found. The condition in these five was a marked meningo-myelitis with thickened meninges

ing upon microscopic examination fatty degeneration with fibrous change. The post-operative course of this group of 39 patients has been investigated carefully. Eleven are completely cured and are able to carry on their regular work; 11 are improved; 9 are unimproved; 4 have been operated on too recently to give data of value; and 4 have died.

The mortality in the group of 23 patients is rather high, but it must be remembered that the operations were performed before the development of present-day technique.

Wassermann-fast Syphilis.

STOKES and BUSMAN (*American Journal of the Medical Sciences*, November, 1920) reporting on this topic conclude their paper with the following statements:

Search every accessible organ and tissue in the Wassermann-fast case by every clinically available method for evidence of syphilitic changes.

Weigh the degree of activity of the process and the extent of damage and probable recuperative power of the most vital structure involved by the infection.

Identify the weakest element in the patient's make-up and estimate the tolerance for arsenic and mercury of the structures which must bear the brunt of treatment by-effects, such as the liver, kidney, and skin.

Do all that can be done to increase tolerance of treatment by protective measures, by extirpation of focal infection, and by selection of the therapeutic agents.

Direct the treatment of Wassermann-resistant patients less toward overcoming the resistance offered by the Wassermann reaction and more toward a satisfactory symptomatic response of the vital structures involved by the disease within the limitations imposed by the weakest element in the tolerance. Get all the symptomatic effect possible short of recognizable damage. If tolerance permits, give at least as much treatment as to a fully developed secondary case.

Recall the fallibility of human judgment,

which in syphilo-therapy at least has had neither the time nor the means to achieve conclusive results, and always regard the Wassermann-fast patient as potentially syphilitic, and for that reason not to be dismissed from careful search for evidence of activity at intervals throughout life.

Of 458 syphilitic patients who had received from twelve to twenty-nine arsphenamine injections combined with mercurial inunctions, the average being fourteen injections and ninety inunctions in eleven months, 6.6 per cent of primary and secondary cases and 22 per cent of latent, late and hereditary cases (average duration thirteen years) remained persistently Wassermann-positive.

Cardiovascular changes are apparently those most likely to underlie a resistant positive Wassermann test in late syphilis (44 per cent) with neurosyphilis 30 per cent, osseous lesions 30 per cent, hepatic, splenic, and gastric syphilis 21 per cent, and other types from 10 to 17 per cent.

More than one type of involvement was the rule in the individual cases of this group. There were only ten patients presenting no other evidence of syphilis than their positive Wassermanns.

Patients with syphilis should therefore be studied from other angles than that of the presenting type of involvement, in the effort properly to appraise their condition and susceptibility to treatment.

Sixty-five per cent of the patients with cardiovascular syphilis had aortitis and 60 per cent myocardial changes.

Of the neurosyphilitics, 40 per cent had paresis and 50 per cent clinical tabes dorsalis.

Fifty per cent of patients with neurosyphilis had cardiovascular syphilis also.

Gastric and hepatic syphilis were recognized in 52 and 47 per cent of the visceral cases as against only 14 per cent presenting recognizable splenic involvement. Patients with cutaneous syphilis showed the familiar immunity from neurosyphilis and the reverse.

While pyogenic foci were present in 74 per cent of the patients with resistant Was-

sermann reactions no frank etiologic connection was apparent. The same was true of alcohol, which was used by only 12 per cent of these patients.

There was no evidence that Wassermann-fastness is the result of infection with any special strain of organism. In fact, the "polystructural" involvement in such cases suggests the contrary.

Nasal Deformities Due to the Submucous Operation.

CARTER (*Medical Record*, Nov. 13, 1920) states that in view of the great popularity of the submucous operation for the relief of nasal obstruction due to deflected septa, and on account of the increasing number of depressed nasal bridges due to this procedure that are coming under the author's observation for operative correction, he feels that a communication upon this subject will not only be timely, but that it may be of distinct value both to the general practitioner and to the rhinologist as a reminder that disagreeable results may and do follow this operation when it is performed without taking into consideration the age of the patient and without due regard for the anatomical and architectural structure of the nose. No less than 26 cases of depressed nasal deformity, due to the submucous operation, have come for correction.

In none of the cases was the deformity due to infection introduced at the time of the operation; it was due either to the operation having been performed at too early an age, or to the destruction of the integrity of the nasal arch by interference with its architectural structure.

The nasal arch is subject to the same mechanical laws that govern any other arch. It is a curved structure composed of an indefinite number of segments so placed that it may be supported at its two extremities. The growth of the nasal septum is a prominent factor in the development of the arch, and its presence strengthens it, but as a vertical support it takes only a minor part in the preservation of its integrity. The up-

per edge of the septum, however, wedged in as it is between the upper lateral cartilages, constitutes the keystone of the arch, and if by operation, accident, or any other influence this keystone is displaced or destroyed, the dorsum of the nose falls in and the nasal arch is established on a lower level. The problem at first is purely a mechanical one; the deformity, however, is later increased by the formation and contraction of scar-tissue and by the elasticity of the skin of the face. Once the keystone has been destroyed, the deformity resulting can be corrected only by the transplantation of bone or cartilage.

One of the most important considerations in connection with the submucous operation, if not the most important, is the age of the patient; and yet this is frequently ignored by the surgeon in his enthusiasm to relieve a distressing nasal obstruction in a child.

What shall we do for the child suffering with pronounced nasal obstruction due to a badly deflected septum? The assumption is warranted that the septum cannot be straightened and the obstruction to nasal respiration relieved without an operation of some kind. In a child extensive destruction of the septum, such as occurs in the usual submucous operation, is certain to result eventually in a deformity of the nose. The character of this deformity varies only slightly in different cases: the base of the nasal triangle is very broad, the bridge of the nose is flattened, and the concavity from above downward is uniform, the greatest depression being at a point corresponding to the ends of the nasal bones. In most of these cases the whole face eventually becomes broad and flat. The conscientious surgeon, though he has clearly in mind the dire results which may follow any operative procedure extensive enough to destroy this function of the septum, is equally impressed by the urgent necessity of relieving a bad obstruction to nasal respiration which, if long continued during the years of active development of the child, is likely to be followed by conditions not only objectionable from a cosmetic point of view, but what is of far greater importance, injury to the gen-

eral health, due to deformity of the jaw resulting in malocclusion of the teeth, mal-development of the chest, mental dulness, etc. These important considerations leave no doubt as to the course to be pursued—the obstruction must be relieved with as little disturbance of the septum as possible.

The course to be adopted in the treatment of the depressed deformities resulting from the submucous operation is a transplant from the ninth rib, composed of two-thirds bone and one-third cartilage; this is taken at the junction of the rib with the costal cartilage. The transplant is introduced from within the nose and no scar results. The full strength of the nasal bridge is restored and the repair is permanent, for some of his cases have been under observation long enough to demonstrate this fully. The bone transplant establishes a firm bony union with the frontal bone and supports the nasal bridge in its normal position; the cartilage preserves the normal flexibility of the nasal tip.

Retroversion of the Uterus.

LYNCH (*California State Journal of Medicine*, December, 1920) voices the feeling of the day to the effect that a uterus may be in any position, provided it is movable, and that symptoms will not occur unless the organ is diseased, or is associated with tubal or ovarian pathology. It is, however, true that retroposed uteri are so often the seat of metritic or vascular changes, and are so frequently accompanied by ovarian disturbances, that the patient usually presents the complex symptomatology at one time ascribed to uterine position. Such cases usually follow birth trauma. Occasionally women who have never been pregnant develop slowly a train of similar symptoms. The uterus gradually enlarges during a period of some years and the ovaries become swollen, cystic, and tender. The symptoms disappear almost invariably after the uterus is suspended by a well-chosen operation. Lynch expresses the belief that a woman's care during the year following delivery may be even more important than

that during her pregnancy. He has undertaken a study of posterior displacements following childbirth, hoping to obtain a number of basic facts. He based this study on 1225 women delivered in his clinic. These people were followed for months and years. As a result he presents the following conclusions:

Forty-two per cent of retroversions were noted in 761 cases observed from 12 to 4 months following their delivery.

Seventy-six per cent of the 322 displacements presented slight or no symptoms. Twenty-four per cent came back because of symptoms. Eight per cent of 439 controls with upright uteri complained of slight symptoms.

Twenty-two per cent of 100 private cases presented displacements. Hard work may be an important etiologic factor for the displacements.

Replacement and pessaries caused anatomic correction in 80 per cent of the cases which wore pessaries. Pessaries were not

applicable in 15 per cent of cases selected for such treatment. Replacement and pessary treatment resulted in symptomatic cure and anatomic correction in 73.5 per cent of cases presenting symptoms.

Subsequent pregnancies were noted during the period of study, or following in 15 per cent of 439 cases which did not have displacements; in 10 per cent of women who had treated or untreated retrodisplacements; and in 5 per cent of 109 cases whose retroversion had not been corrected.

No one type of operation has been entirely successful in the author's hands. There were two recurrences in 89 operations which made a new round ligament fixation upon the uterine fundus (45 Webster's, 28 Coffey's, 16 atypical). There were four recurrences following 27 Kelly-Neel suspensions, together with shortening the uterosacral ligaments. Since operations have not proven 100 per cent perfect, the need of early pessary treatment is readily apparent.

Reviews

LE DIABÈTE SUCRÉ, ÉTUDES CLINIQUES, PHYSIOLOGIQUES ET THÉRAPEUTIQUES. Dr. Marcel Labbé, Professor de Pathologie générale à la Faculté de Paris Médecin de la Charité; Masson et Cie., Éditeurs, Libraires de L'Académie de Médecine, 120, Boulevard Saint-Germain, Paris (VI^e), 1920.

Labbé, a well-known student of diabetes, in the present volume sums up the attitude of the French school toward the diabetic problem. For him diabetes is not a morbid entity, but a syndrome dependent upon disturbances of the sugar-regulating apparatus. Among the possible causes of diabetes he rejects—an unusual thing in a Frenchman—arthritis as a possible factor in the disease. The essence of diabetes is the total or partial absence of combustion of the carbohydrates introduced in the food or formed within the body. He distinguishes

two main types of the disease: (a) diabetes without emaciation, which is the more frequent; (b) diabetes with emaciation, corresponding to the former French classification diabète gras and diabète maigre. The retention of sugar in diabetes leads to hyperglycemia and to hyperglycistia—that is, an accumulation of sugar in the blood and in the tissues. Contrary to the opinion of most American physiologists, Labbé believes in the derivation of sugar from ingested fats. A number of chapters are merely reprints of earlier articles and deal with special points of the disease; for example, painful syndromes in diabetes, as (1) neuralgia and neuritis; (2) painful arterial lesions; (3) myalgia; (4) arthralgia. Other topics discussed are diabetes

and typhoid fever, diabetes and edema, diabetes and intertrigo and vulvar erythema.

An interesting chapter is devoted to the relation of infectious diseases to diabetes, the author citing cases that seem to indicate that diabetes may be a direct sequel of certain acute infections. In the chapters on pancreatic diabetes no mention was found of the fundamental work of F. M. Allen, while in the section on treatment Allen's method of fasting, which the author states was announced about the same time as Guelpa's treatment by fasting and purgation, is dismissed in a few lines. The chapters dealing with acidosis and diabetic coma are generally very good. In the diagnosis of obscure cases of coma, lumbar puncture and the application of Gerhardt's purgation, is dismissed in a few lines. The fluid should be mixed with 1/10th volume of solution of chloride of iron. In the treatment of acidosis and diabetic coma little is said about the exclusion of fats which has come to be a standard method of treatment in this country. The food which according to Labbé should be absolutely proscribed in the treatment of acidosis is meat.

The book will prove useful and suggestive to all those who are concerned with the practical treatment of diabetic patients or who are interested in the many scientific problems presented by the disease.

D. R.

MEDICAL CLINICS OF NORTH AMERICA. January, 1921. W. B. Saunders Company, Philadelphia, 1921.

This issue of the Medical Clinics of North America is called the Philadelphia Number, because all of the articles are by clinicians who are connected with Philadelphia teaching institutions or hospitals. Altogether there are twenty contributions. The first is by Dr. Alfred Stengel on the Use of Serum and Blood of Convalescent Patients in the Treatment of Lobar Pneumonia and Influenzal Pneumonia. The second clinic is by Dr. Thomas McCrae on Pain in the Lower Back. Other noteworthy

contributions are by Dr. Riesman on Phlebitis and Thrombosis; by Dr. Funk upon the Importance of Studying the Altered Position of the Diaphragm; and there are additional papers by Dr. Landis upon Aneurism of the Thoracic Aorta; by Dr. Griffith upon Types of Anemia as Seen in Early Life; and by Doane upon Some Manifestations of Alcoholism. A very interesting paper is that upon Calorimetry in its Application to Clinical Medicine by Fussell and Jonas, and another by Dercum upon Problems in Disorders of the Internal Secretions.

THE ANATOMY OF THE NERVOUS SYSTEM FROM THE STANDPOINT OF DEVELOPMENT AND FUNCTION. By Stephen W. Ranson, M.D., Ph.D. Illustrated in black and in colors. W. B. Saunders Company, Philadelphia, 1920. Price, \$6.50.

The publishers have seen fit to bring out their text on very handsome paper with wide spacing between the lines. This fact makes the book even at first glance most attractive. As intimated in the title, the object of the author has been to place emphasis on the developmental and functional significance of structure; or, in other words, the student is led at the very beginning of his neurological studies to think of the nervous system in its relation to the rest of the living organism, which manifestly must increase his interest in the subject very materially.

It goes without saying that for both physiological and clinical neurology, a knowledge of conduction pathways and functional localization is essential, and this book is designed to give the student just these facts. Furthermore, comparisons are made between the brain of the lower animals and the brain of man. Illustrations have been borrowed from many authors, but the majority of the figures have been made from original drawings.

How much time there is in a crowded medical curriculum for students to devote to a volume of this character must be determined by each professor of anatomy. Many will be content with the knowledge which is to be obtained from standard

books on anatomy, but others will turn to the volume of Dr. Ranson, feeling that he has produced a compilation of facts which they and their students can utilize with advantage.

THE PSYCHOLOGY OF THE SPECIAL SENSES AND THEIR DISORDERS. By Arthur F. Hurst, A.M., M.D., F.R.C.P. Oxford University Press, London and New York, 1920. Price \$5.00. Pp. 123.

Many American physicians will remember Dr. Hurst because of the interesting illustrated lectures which he delivered in this country a year or two ago as the result of his experience with nervous disorders which developed among soldiers during the course of the world war. The pictures which he showed us at that time were remarkable, because of the severity of the functional nervous disturbances which were present and because of the rapid cure which proper treatment achieved when psychologically induced. The present book really represents the Croonian Lectures which the author delivered upon this subject, and contains 123 pages with quite an adequate bibliography. The book opens with a discussion of the Nature of Hysteria, and follows with chapters upon Cutaneous Sensibility and Cutaneous Anesthesia, with others upon the Superficial Reflexes in Hysteria; the Sensibility and Reflexes of Mucous Membranes; Cutaneous Hyperesthesia; Hysterical Pain; Disorders of Hearing; and Hysterical Disorders of Sight. It is one which should be in the hands of every physician who is engaged in military practice or during times of nervous stress and strain, and many others will be interested in the neurological propositions concerning functional disturbance which he discusses.

LOGIC OF THE UNCONSCIOUS MIND. By M. K. Bradby. Oxford University Press, London, 1920. Price \$6.40; pp. 316.

We are not quite sure how we are to present this book to our readers, or whether its contents will prove of material interest to them. The preface tells us that the book purports to be a sketch, not a finished

thesis, and that it presents "the view of the logic in life obtained by one who sees them in strong colors but misses subtleties, and perhaps much else." With this honest confession before us we are not surprised to find that the text expresses ideas which at least are original. The book is divided into three parts. The first deals with the Unconscious Background to Conscious Reasoning; the second with Unconscious Motives the Source of Fallacy; and the third with Logic Applied to Life. One of the chapters in Part I deals with Dreams and Unconscious Symbols, and a chapter in Part III deals with the Logic of God and Devil, while another discusses Popular Misconceptions Concerning Reason. Perhaps these statements will give our readers some conception of the themes with which the author deals.

THE AMERICAN YEAR-BOOK OF ANESTHESIA AND ANALGESIA. Edited by F. H. McMechan, A.M., M.D. Surgery Publishing Company, New York, 1921.

This edition of the American Year-book dealing with anesthesia and analgesia from the surgical standpoint in reality covers the years 1917 and 1918, its earlier appearance having been delayed by the war. It is handsomely printed and is really brought up, in many respects, to a later date than the two years which we have named. The volume contains nearly 500 pages, and articles are contributed by no less than 91 contributors. The volume also contains an index of the current literature on anesthesia for the two years named as well as an index of its own contents. It is impossible to review each individual article, many of which are most excellent and all of them good.

There are discussions on the use of Anesthesia in the Surgery of Epileptics and the Handling of Children with Tuberculosis; upon Alcoholism and Morphinism as Complicating Factors of Anesthesia; upon the Operative Risk in Cardiac Disease, and on The Prophylactic use of Pituitrin in Nose and Throat Operations under General and Local Anesthesia. So, too, there are

papers upon the state of the blood as to carbon dioxide and alkali reserve under ether and nitrous-oxide-oxygen anesthesia.

Other papers which we think will interest our readers are the Relationship Between Blood-pressure, Surgical Procedures, and the Use of Anesthetics. There is also a chapter upon Ethyl-Chloride-Ether consequent upon the Employment of Apotherine and upon the use of Benzyl Alcohol.

A very considerable number of the articles are illustrated in an effective manner. The volume is one which every physician, who uses anesthetics or analgesics, will do well to possess.

THE AMERICAN RED CROSS WORK AMONG THE FRENCH PEOPLE. By Fisher Ames, Jr. The MacMillan Company, New York, 1921.

Giving the title of this book clearly explains its scope. As the author well says, it is impossible to give a full account of the activities of the American Red Cross among the French people during the world war, yet the author has deemed it wise to introduce work which has been done immediately following the Armistice, although he does not take up post-war activities in detail.

Almost every citizen of the United States knows something of the work of the Red Cross in one or all of its fields. The present book is not only an interesting statement of what was accomplished, and an excellent illustration of all that America did in helping the people of a friendly country, but should war arise in the future it will form an admirable text-book to be put in the hands of future generations, not only to show them what was done in the world war, but to inspire them with the same nobility of purpose and show them how their efforts may best be expended. The idea must not be gotten, however, that the text deals with uninteresting statistics. On the contrary it is well written, easily read, and may be picked up at any time for the purpose of utilizing an otherwise idle hour with both gain in morale and excellent entertainment.

THE OXFORD MEDICINE. By Various Authors. Edited by Henry A. Christian, A.M., M.D., and Sir James MacKenzie, A.M., M.D., F.R.C.P., F.R.S. In six volumes, illustrated. Volume III. Oxford University Press, London and New York, 1921.

The present volume of so-called Oxford Medicine deals with diseases of the digestive system, the kidneys, and the ductless glands. In general it may be said that the thirteen contributors have a higher rank on the average than the contributors in the preceding volumes. We note amongst their names those of Sir John Rose Bradford, Joseph H. Pratt, Martin E. Rehfuss, David Riesman, Sir Humphrey Rolleston, Sippy and Stockton as names which are familiar to many American medical men. Doubtless the other authors by virtue of their contributions have attained equal standing.

It will be recalled that Oxford Medicine comes out in a form in which, by reason of a special binding, additional pages can be added to each volume from time to time by the purchaser.

It is hardly necessary for us to state that in each instance the writer deals with the theme with which his name is closely associated: thus Bradford deals with war nephritis; Plummer with diseases of the thyroid and parathyroid glands, but his article is to follow, having apparently been delayed. We would naturally expect that Sippy would contribute that upon ulcer of the stomach and duodenum, and equally important that Martin E. Rehfuss should write upon diseases of the stomach, while Rolleston, who has devoted so much time and ability to hepatic disorders, should contribute the two chapters upon diseases of the liver.

We note with pleasure that the articles in this volume will prove of more practical value to the general practitioner and to the specialist than did many of the articles in earlier volumes. Nearly all the authors recognize the fact that the discussion of a subject in general terms, no matter how valuable it may be, does not meet the needs of the man who is hard at work at the bedside.

DIAGNOSTIC AND THERAPEUTIC TECHNIQUE. By Albert S. Morrow, A.B., M.D. Third edition, illustrated. W. B. Saunders Company, Philadelphia, 1921. Price \$8.

When the first edition of this book appeared in 1911 we took pleasure in referring to it in complimentary terms, and we are glad to know that in the space of ten years it has been reprinted a number of times and that a third edition has now been brought out. In its third edition it makes a very considerable volume of nearly 900 pages, well spaced and with large type, with hundreds of illustrations which are fashioned to show the physician the procedures which are advised. It deals with a wide field, from the administration of general and local anesthetics to sphygmomanometry, transfusion, the treatment of neuralgia by injections, the disinfection of wounds, the preservation of pathological material, exploratory punctures and aspiration, and with measures which should be utilized in connection with the nose, ear, throat, esophagus, stomach, bowels, and genito-urinary tract in both the male and female. While not especially intended as a text-book for students, it is especially designed as a handbook for the general practitioner.

The last edition is brought thoroughly up to date, and we can promise the author and publisher a greater popularity than either the first or second edition obtained.

JOHNS HOPKINS HOSPITAL REPORTS. Volume XX, Fasciculi I and II. The Johns Hopkins Press, Baltimore, 1920.

Dr. William G. MacCallum contributes, from the Pathological Department of Johns Hopkins University, a very exhaustive report upon the pathology of pneumonia in the United States army camps during the winter of 1917-18. Although these two fasciculi have just appeared we note that they were received for publication on October 15, 1918, which is two and a half years ago. We are told that these studies have grown out of the work of two commissions sent out by the Surgeon-General of the

United States army to investigate epidemics of pneumonia among the troops. In both of these commissions Dr. MacCallum played an active part at Fort Sam Houston, Texas, and at Camp Dodge, Iowa. The first fasciculus contains more than 150 pages, with excellent plates numbering 53, and the second fasciculus, continuing these plates, carries the number to 76. The plates are most excellent. Taking them as a whole they are possibly the best illustrations of pathological material in black and white that we have ever seen.

Turning from this aspect of the report to the text itself, we can speak with equally high praise. It is not only exhaustive, but what is equally advantageous to the science of medicine it is conclusive; in other words, it is not a mere array of post-mortem results, but in addition a competent and adequate series of deductions reached by the distinguished pathologist who makes the report.

The second fasciculus bears a somewhat different title from the first. It deals with the pathological anatomy of pneumonia associated with influenza. We do not know of any study or contribution of equal value which has appeared in medical literature in the United States for many years.

JOHNS HOPKINS HOSPITAL REPORTS. Volume XXI, Fasciculus II. The Johns Hopkins Press, Baltimore, 1921.

This fasciculus of the Johns Hopkins Report contains a clinical study of 200 cases of tuberculous salpingitis by J. P. Greenberg, the contribution being from the Gynecological Clinic of the Johns Hopkins Hospital. The author points out that until 1886 tuberculosis of the female reproductive organs had always been considered a rare condition, but that since that time an enormous amount of literature has accumulated from every aspect of the subject. Greenberg also notes that as recently as 1909 the disease was considered uncommon enough by some persons to justify reports of single uncomplicated cases, and he expresses regret that modern text-books pay

so little attention to this important subject. A very copious and exhaustive bibliography of the subject is included.

Amongst the conclusions arrived at by the author are that tuberculous salpingitis occurred in nearly one per cent of all women admitted to the gynecological service of the Johns Hopkins Hospital. It was found one and a half times as frequently among the colored as among the white women, and out of every thirteen abnormal tubes removed at operation, one was tuberculous. The average age was between twenty and forty. The chief complaint was pain. Half of the patients had lost weight. One-fourth had pulmonary tuberculosis, and a correct diagnosis before operation was made in only 13 per cent, and in more than half of these diagnosis was aided by the presence of ascites. In 99 per cent of the cases both tubes were involved. In 68 per cent the peritoneum was also involved. In only two per cent was there a decided involvement of the urinary tract.

Finally it is interesting to note that by means of follow-up letters 90 patients were traced, and out of this number 78 were found to be living from two months to thirty years after the operation, and nearly all of them being in good health.

OPTIMISTIC MEDICINE, OR THE EARLY TREATMENT OF SIMPLE PROBLEMS. By a Former Insurance Man. The F. A. Davis Company, Philadelphia, 1921. Price \$3.

It is not quite clear to us why this book should be published anonymously. The topics dealt with are contained in sixteen chapters, the first of which deals with Optimism as a Remedial Measure, the second with The Coöperation Between Doctor and Patient, and the third is entitled Partial Immunity to Disease; from here on the chapters deal with childhood and its problems, adolescence, the house-mother who worries, the tubercular suspect, the overworked businessman, and then there is a chapter upon the early grandmother

stage. There are other chapters upon The Celibate of Fifty or Sixty, the Methods of Retaining Efficiency Late in Life and Getting Back to that which is Natural.

The book is one which can be read both by physician and patient in many instances with advantage. As is seen from the titles of the chapters, the author, whoever he may be, is original in his ideas, and an examination of his text shows that he is clear in their description.

SURGICAL ASPECTS OF DYSENTERY, INCLUDING LIVER ABSCESS. By Zachary Cope, B.A., M.D., M.S. Lond., F.R.C.S. Eng. Oxford Medical Publications, Henry Frowde. Hodder & Stoughton, London, 1920.

Cope, basing his study on the surgical complications incident to some thousands of cases of dysentery, includes in this book some portions of his Hunterian Lecture.

His first chapter is devoted to a discussion of Pathological Lesions and the Connection Between Surgery and Dysentery. Later chapters: Surgical Complications of Dysentery; Perforation—Local Edematous Colitis; Dysenteric Appendicitis, the Colonic Pus Sac; Stricture of Colon—Perinephric Abscess—Periproctitis; Remote Lesions Caused by the *Amœba Histolytica*—Amœbic Hepatitis; Arthritis and Conjunctivitis.

This book is well illustrated, excellently condensed, sound and conservative, and constitutes, if not a comprehensive treatise upon this subject, an eminently satisfactory one. The treatment differs little from that accepted as standard. For the amebic type hematin is advised; for the Shiga Flexner, antidysenteric serum should be given. Attention is called to the fact that the onset of the disease is insidious and that gross pathological lesions may exist without any symptoms. In ulceration of the cecum constipation may be the complaint. At times diagnosis can only be made by examination of the stools and by the therapeutic test.

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Original Articles

Topics in Orthopedic Surgery of Interest to the General Practitioner

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The derivation of the word "Orthopædic" (from *ὀρθός*, straight, and *παῖς*, a child, or *παιδεύω*, to educate) betrays that the original scope of this specialty was toward the correction of asymmetry or deformity in children. The present field of orthopedic surgery is, with the exclusion of new and inflammatory growths, the correction of congenital and acquired deformities, without limitation of their observation in children alone. Nevertheless, this paper will occupy itself chiefly with the congenital and acquired deformities observed in children.

If congenital deformity and the initiation of acquired deformity were promptly, faithfully, and intelligently cared for, the percentage of deformity in childhood would be vastly reduced. This paper will therefore deal principally with the early recognition of deformity, and of conditions with asymmetric tendencies, because it is the failure to note these conditions in time that is chiefly responsible for the "hunchback," the grossly deformed lateral curvature, the contracted knee, the hip-joint riddled with sinuses discharging pus, the unsightly knock-knee, bow-leg, etc., etc. The early recognition of these conditions is the domain of the general practitioner — their treatment, that of the orthopedist.

Every growing child from infancy, at least to the age of twelve, should be examined carefully, completely stripped, at least

once a year. The necessity for periodic examination of the teeth, independent of distress, is generally recognized, but that of the body, which has far graver possibilities, is almost universally neglected. Those of us who examined recruits for the army must feel that the subject is of sufficient importance toward national efficiency for annual inspection to be of governmental concern and regulation. To some extent it exists in the Department of Physical Education of our public schools; but there are a very large number of children who do not go to the public schools. Moreover, a very if not the most important period, from birth to the age of five or six years, prior to entrance to school, is one that not only includes congenital deformities and those secondary to rickets, such as knock-knee, bow-leg, lordosis, scoliosis, anterior angular tibial deformity, and ventral hernia; but the tubercular arthritides, as seen in the posterior angular deformity or kyphosis of Pott's disease, with or without psoas abscess; hip- and knee-joint diseases, not infrequently suppurative, and carrying with them lifelong penalties of shortened, ankylosed, and distorted limbs.

In something above 90 per cent of fires, there has been a time in which they could easily have been extinguished. Likewise in acquired deformities there has been a period in which they could have been con-

trolled, and deformity obviated. While this is not true to the same extent in the congenital deformities and the paralyses, it is in some, and in the others the sooner they are under intelligent care the better the prospect.

Congenital Deformities. — In the pre-school period the child is not infrequently under the observation of the general practitioner. His first opportunity for the examination of the child is at birth. If there is clubfoot, its treatment in the way of molding should begin at once, and by operation, if required, soon after it is able to walk—not before, because the body weight is required to preserve the correction obtained. In hare-lip uncomplicated with cleft palate, the time of election for operation is the third month—that is, before dentition. If complicated with cleft palate, the lip operation may be postponed until after palatal closure if the greater room and light obtained by the open lip is required. The palate operation may be done early in the third month or delayed not later than the third year, which is after primary dentition is complete.

In congenital dislocation of the hip the period of election is between the third and sixth year. The waddling gait and the distortion will daily call to mind the need of correction. In spina bifida, the period for operation depends upon whether there is risk of rupture of the sac or not. If so, interference should be prompt; if not, it may be delayed till the child is two months old, or strong enough to better withstand operation, for the mortality is high. Supernumerary fingers may be amputated early. In web fingers it is difficult to retain good separation, and interference is better delayed till childhood.

When the weaning of the infant is discussed; when the baby is vaccinated or circumcised; when the child develops chicken-pox, or measles, or mumps, or adenoids, or tonsillitis, etc., etc., there are opportunities for an attentive general practitioner to strip the child from time to time in its growth and examine it critically.

Acquired Deformities, Rickets. — The

bottle-fed infant should be watched with expectancy for delayed closure of the fontanelle, a pouting umbilicus, a wide inferior costal angle, a rachitic rosary at the junction of the costal cartilages, incipient pigeon-breast or funnel-chest, enlarged epiphyses, a scoliotic or kyphotic spine, and retardation of rickets. The infant will possibly be heavy, and should not be carried on the mother's right arm only, for fear of postural scoliosis.

The mother should be not only warned but intimidated from placing her infant upon its feet too early, lest it develop knock-knee, bowed femora or legs, and anterior tibial deformity, not forgetting flatfoot. In rickets the deposit of lime salts is late. The cartilaginous limbs are easily deformed. They are therefore subject also to restoration to line by persistent manipulation, by scrupulous periodic adjustment of corrective braces—if these measures are employed before ossification is far advanced, preferably before the end of the third year.

The general practitioner will not secure a good mechanical result by writing out for the mother the address of an instrument maker and letting his responsibility go at that. It is not the carrying of a burden of steel, nickelplate, and leather, at some expense, that will effect correction. Braces must be made *to fit; to apply pressure at certain spots and not at others*. They must be declined and payment withheld until they fulfil the requirements. Not only must the brace be right when paid for, but it must be kept so. That can only be achieved by periodic observation and intelligent adjustment; otherwise the child is punished with a useless burden, the parents with inexcusable expense, and avoidable operation will be required.

After the fourth year mechanical correction of knock-knee and bow-leg will not support hope, and operative treatment is indicated. The child can spare the time better for osteotomy before it has begun to go to school.

The best chance for correcting pigeon-breast and funnel-chest by breathing exer-

cises and manipulation is before the fourth year. The earlier the fight with flatfoot is begun by exercises—not by insoles—the better. It will require patience and persistence on the part of the mother, physician, and child. The utility of thickening the inner side of the sole and heel as contrasted with the outside should not be forgotten. It gives a varus position to a pronated, almost valgoid, foot and is of much service.

If the child's limbs are of unequal length, either congenitally or due to unilateral flatfoot, or bow-leg, or knock-knee, or unequal development, one side of the pelvis will be lower; the hips will be tilted, the lumbar spine become convex on the short-legged side, the thoracic spine will develop a compensatory convexity on the other side, posterior rotation of the ribs follow, and a full-blown, pathetic scoliosis develop unknown to mother and general practitioner until the age at which corsets are purchased, and the mother discovers the asymmetry and seeks advice with much alarm concerning a new and suddenly developed condition. It is true that the development of the figure, beginning about the twelfth year, makes the deformity more noticeable, but it is also plain that the short limb or the scoliosis that occurs with limbs of equal length was there to be seen years before, if the physician had taken the trouble to look for it as a possibility. The house-mother who plants a vine takes the trouble to train its direction. Is not a growing child worth the same observation and precautionary care?

Scoliosis or lateral curvature is not a deformity of the back only. It is much more than that. It is a deformity of the trunk. Besides the spine, the ribs, sternum, and sometimes clavicles and hips, as well as the muscles and ligaments, are involved in the distortion. To study its extent toward measures for its correction, or to examine a child to see if scoliotic tendencies exist, the subject must be nude and studied from the front as well as the back, and from the right as well as the left side. It facilitates accurate examination if the subject stands upon a platform or pedestal

that will bring the hips nearly as high as the eyes of the observer. The anterior and posterior superior spines of the pelvis should be marked with a soft "china marking" pencil or with ink, and also the posterior vertebral processes—all of which should be felt before being marked, as their apparent position is often misleading. As viewed from the back, the posterior pelvic spines should be on the same level, likewise the height of the malleoli, inner condyles of the femora, inferior gluteal creases, inferior angles and acromion processes of the scapulæ. The internatal crease and the spinal line should be vertical, and the ilio-costal spaces at the waist symmetrical. As seen from the front, the anterior superior spines and the line of the clavicles should be horizontal and the linea alba vertical. Those who are beginning to make these examinations will be amazed to find that in the same subject the same deformity will, quite frequently, seem much more pronounced when viewed from the front as contrasted with the back, or *vice versa*; in the same way the views from the right and left sides. Occasionally inconsistent deformity is noted: for instance, the right leg may appear shorter than the left from in front and longer than the left in the back. This is due to a buckled pelvis in which the right superior pelvic spine is lower in front but higher in the back than its fellow.

The practical way to build up a short leg to equal length with the long leg is not to measure from the internal malleoli to the anterior superior pelvic spines, and add the difference to the heel of the short side, because such procedure takes no account of unilateral flatfoot and differences in height of the malleoli from the ground. The practical way is to mark the subject as heretofore described and build up the short leg by putting blocks or books under it, until as viewed from front and back the best result is obtained in straightening the whole figure. The thickness of the blocks or books is then measured, and a lift of that height added to the heel of the short limb. These examinations are worthless unless the subject is so placed that the light shall come

directly in the axis of the observer and the subject, as unilateral or unequal side lighting is particularly misleading.

With the date of the observation, detailed notes should be made of the conditions seen, for comparison with future examinations. According to the degree of deformity will the subject be treated with a series of casts applied according to the Forbes or Abbot methods, to be followed by exercises; or to be treated from the beginning with exercises with or without apparatus. Where there is a short limb it should, of course, be built up at once.

Scoliosis is not only due to rickets, it is a sequel to pleurisy with adhesions, to infantile spinal and unilateral paralyses, to unilateral occupations. It is the duty of the general practitioner to see it before it comes, to be prepared to forestall it by prophylactic measures and exercises. To beat scoliosis you must fight it like fire, be prepared in advance, and attack it in its formation in the beginning.

Posterior curvature of the spine, as well as lateral, every now and then arises from rickets. It is not unusually associated with delayed speech and delayed walking. Diagnosis is to be made from Pott's disease, from paralysis of some form, and from congenital defects. The presence of other lesions of rickets, the absence of symptoms peculiar to Pott's disease, to paralysis, and to congenital defect, should guide the general practitioner to hold out hope to the anxious parent. The child should be treated mechanically as if it had Pott's disease and constitutionally as if it had rickets. The progress will be slow for a couple of years, but the final result will be satisfactory.

Infantile Spinal Paralysis.—The sequels to anterior poliomyelitis come to the orthopedic surgeon, but the onset is attended by the general practitioner, and in light cases is sometimes not even seen by him. It is not at all an infrequent story that a child has been a little ill, and after a day or two in bed is up and about, but limping, and the lameness is attributed to some recent fall and no professional advice sought for some months. It must not be forgotten

that the diseases of childhood are occasionally followed by paralyses.

There have been long periods in which anterior poliomyelitis was not epidemic, was not serious in type, attacked only one child in a family, did not appear contagious, and occurred all the year round; but Dr. Wharton Sinkler observed it to be most prevalent in the summer months, and especially in August. In recent years there have been several epidemics, and one which, like influenza a couple of years ago, exhibited an appalling mortality.

In the New York epidemic of 1916, the houses in which epidemic anterior poliomyelitis occurred were for the first time quarantined. Where possible the patients were removed to special hospitals. Not only several instances of three cases coincidentally occurring in one family, but 5 to 7 per cent of secondary cases in one family were observed. Like the influenza, this was an unusual manifestation, but it made plain the need for isolation. The Italian quarter was especially infected, but Dr. Baer's report from Baltimore showed that negroes were not immune, and that the usefulness of serum injection is yet to be proven.

The care of these patients in the New York hospitals was placed under the supervision of orthopedic surgeons. Dr. Lovett of Boston has enumerated five problems of after-treatment:

1. *The prevention and treatment of contractions*, those of the hip and shoulder being the most difficult to control and easy to overlook; those of knee and heel are more apt to be noted and less difficult to manage. It must be the aim of the physician in charge to prevent positions of limbs which allow shortening of muscles—*e.g.*, holding the arms to the side, flexion of the thigh and knee, and hyperextension of the foot.

2. *Braces*, to be worn where there is a tendency to abnormal positions in order to prevent, for instance, foot-drop; also to reduce weight-bearing.

3. *Rest and fatigue*. Walking too early, excessive massage or exercise are to be

avoided. The less walking, when the legs are involved, in the first year, the better. Without weight-bearing the affected muscles can be given developmental exercises.

4. *Muscle training* of the weak muscles without overtiring, and with preliminary testing of the individual muscles of the affected part, followed by the prescription of definite exercises to be precisely carried out. This work to be efficient and not detrimental requires special training.

5. *Prognosis* dependent on the degree of involvement must be most guarded.

The after-care of infantile paralysis requires that its victims should be kept under intelligent care, and while the weak muscles are to be exercised they must not be overworked. Dr. Baer of Baltimore has thus summarized the pathology of anterior poliomyelitis: (1) The degeneration of the cells in the anterior horn of the spinal cord by the toxin itself. For these cells there is no hope. (2) The incapacitation of other anterior horn cells by edema. These cells with the muscles controlled by them will recover in from two to six months. (3) The temporary injury to still another group of cells by hemorrhage, from which recovery will probably occur in from six months to one and one-half years. He advises complete rest for three to six months in deference to the results from edema, but Lovett, in selected cases, advises a longer period. In the matter of hemorrhage, Baer would protect his patients for another six months to one and one-half years by the use of braces toward preventing contractions.

The sequels of infantile spinal paralysis, the contractions of hip, knee, foot, and heel, are suitable for operative relief after all hope for regeneration has passed. In the present consideration it is not suitable to consider operative measures in detail, but it may be said that in the stabilization of the paralytic foot Dr. G. G. Davis, late of this staff, has perhaps carried orthopedic assistance furthest by his methods of arthrodesis of the ankle joint and of the subastragalar joints; also that children are

not eligible for these operations until seven years of age.

Tubercular Arthritides.—The successful care of tubercular joint infection is dependent upon early detection, the removal of weight-bearing, the immobilization of the joint, and the ability to provide good feeding and hygienic conditions—especially exposure to sunlight.

The tendency of caries of the vertebral bodies—Pott's disease—is toward the erosion of a gap in the supporting spinal column, not unlike that of the wedge chopped out by the woodsman in felling a tree. The result is similar; the weight of head and shoulders at first acutely bends the column. The sharp angle or deformity in the back is known as the kyphos. The erect posture of man seems to be contributory, because of superincumbent weight, to this deformity. In the quadrupeds with horizontal spines, posterior spinal deformity or kyphos is yet to be observed. This points the treatment need of promptly forbidding erect posture, of placing the patient not only horizontal, but with the kyphos or deformity supported, that is pushed forward, by a felt pad so that the weight of hip and shoulders may tend toward immediate reduction. If it is borne in mind that friction, weight, and movement of the eroded surfaces upon each other will tend to cause further breaking down of the infected area, it will be recognized that recumbency must be assisted by immobilization—for instance, by a strap of webbing fastening each shoulder to the mattress and one encircling the hips between the anterior superior pelvic spine and the trochanters. These three straps will prevent the patient from turning on either side. As the spring mattress, hung at either end like a hammock, and like it sagging in the middle, has become universal, it must be remembered that it is unfit as the bed support of a kyphotic spine because tending to further increase deformity. The indication is, therefore, for a frame of piping to which a canvas mat, eyeletted round its four sides, is laced tight as a drum by reliable but not thick rope. The canvas mat so

laced may sag with weight from side to side, but practically not at all from end to end. If the patient has the good fortune to command quarters with windows admitting the sun at all times of the day, it is worth while to have this frame supported on another rolling on swiveled rubber-tired wheels of large diameter—*e.g.*, one that will permit easy movement of the wheel cot in pursuit of the sun, and, when possible, taking the patient out-of-doors. For the acute stage of onset, until ankylosis by the formation of reparative connective tissue in the eroded area has been secured, and all signs of suppuration ceased, this is the ideal method of treatment toward reduction of deformity and securing dependable cure. After this stage the splinting of the spine by a Taylor brace without a head-piece when the lumbar and lower thoracic spine is involved, but with a head-piece when the upper thoracic or cervical spine is diseased, can be safely instituted and the patient gradually gotten up and about.

If there is resulting abscess, and it must be looked for, it will be found probably in the posterior pharynx in involvement of the cervical vertebræ in the spinal muscles if the thoracic vertebræ are the site of disease; and in the sheath of the psoas muscles, as may be palpated through the abdominal wall, if the lumbar vertebræ or the last thoracic are the infected area.

While pus is evacuated—and carious bone is removed at the present day—the tendency is toward less radical surgery in the acute stage, and toward more reconstructive interference in the chronic. There are not so many psoas abscesses drained from flank to abdomen or thigh as formerly. Yet I have so drained psoas abscesses and seen them get well. There has been some use of chlorine solutions in the treatment of tubercular processes.

When either there has been no abscess, or months have gone by without recurrence after healing, then a spine may be braced by a bone graft or transplant taken from the tibia and with fair prospect of it so

strengthening the weakened column as to obviate the need of an external brace.

Another sequel of tubercular vertebral arthritis, when the upper thoracic and lower cervical vertebræ are involved, is paralysis. The prognosis for recovery is fair, if immobilization and hyperextension are employed early and persistently. I call to mind a little girl with high Pott's disease and resultant paralysis, who had passed through several hands, including my own, without amelioration. She finally came under the care of Dr. James K. Young, who decided upon a laminectomy and invited my assistance. I tried to dissuade him, and failing, assisted him. His purpose had been the relief of pressure from angulation of the vertebræ. The removal of the lamina relieved pressure of another character—abscess within the spinal canal. Its evacuation and drainage were followed by marked improvement in the paralysis. The operation took place in this house. I did not learn the final result, but I always bear the case in mind as a possibility in others.

My initial consideration of the pathology of Pott's disease with an immediate step to treatment by recumbency, immobilization, and hyperextension was deliberately intended to stress the importance of prompt resort to these measures in this disease. Unfortunately, the first symptom observed is too often deformity or abscess, and possibly even paralysis. It is needless to say that the appearance of these symptoms is very late in the process of onset. It should be the aim of the general practitioner to diagnose earlier and less suggestive symptoms. Slight elevation of temperature is sometimes present, but night cries or awkwardness in movement and limitation of mobility of the body should point the need of immediate examination. The child should be stripped, laid face downward on the bed or preferably on a more rigid surface. The legs should be bent up at right angles to the thighs, the ankles just above the feet taken between the thumb, index and middle fingers of the right hand of the examiner, while his left hand is placed lightly upon

the back. By lifting the right hand, and with it the lower limbs gradually, and ultimately the pelvis, and by swaying the right hand with the parts it holds from side to side, any suggestion of limitation of motion or hyperextension of a normal spine will be promptly noted. It goes without saying that the spine will be rigidly inspected for any posterior deformity. The child will then be turned upon the back and the iliac fossæ deeply palpated for possible psoas abscess. The child will then be asked to stand and pick a penny off the floor. If it gains its reward by using its legs only and not bending its back, the action is very suggestive of spinal rigidity. In older children and in adults the patient stands with back to the examiner, who grips the hips in both hands and has the patient turn to the best of his ability to the right, to the left, and hyperextend the head and neck, looking upward and finally backward as far as possible. With this method of examination, not relying on *x*-ray only, early tubercular invasion of the spine should be detected.

The wide scope of this topic makes extended consideration of any subject impossible. The next joints coming under our notice are very important, because they involve locomotion—the sacroiliac joint, the hip-joint, the knee-joint, and the ankle-joint.

Sacroiliac disease is characterized by the patient having a sense of falling apart in the region of the pelvis. Relief is obtained by placing the hands upon the hips. Pain is aggravated by sighing, laughing, coughing, sneezing, anything causing deep respiration, or increasing pressure within the pelvis. The weight is borne on the sound limb. The foot of the affected side is advanced. As the hip-joint is not usually coincidentally involved, the latter symptom is apt to be misleading because examination of the mobility of the hip-joint will be normal. Resort should be had to *x*-ray and to consultation.

The Hip-joint.—It is known to all general practitioners that pain at the knee is suggestive of arthritis in the hip through the message received through the obturator

nerve. Pain in the knee should always be followed by examination of the hip. The bearing of weight upon one limb, the advancing of the foot on the other side in abduction, flexion of the femur, accompanied by rigidity, pain, and sometimes night cries, form the typical picture of invasion of this joint. All of these symptoms may not be noted in a given case, but the observance of any should prompt examination.

Again the child should be stripped, and likewise placed prone on a firm surface. This is not the usual procedure, but you will arrive at your conclusion more rapidly by placing the left hand over the sacrum, holding the pelvis firmly down, and then taking first one ankle and then the other with the leg bent at right angles to the thigh and lifting first one thigh and then the other in hyperextension of each hip-joint, and also swaying the limb from side to side. Limitation of the motion of the hip-joint in hyperextension is discernible more early and more easily than in the usual manner of studying flexion and rotation. These observations should by no means be omitted. The patient is turned on the back, the leg bent upon the thigh, and the thigh upon the abdomen, first on one side, then on the other, with a keen eye watching the lumbar arch to note whether the pelvis and femur have become abnormally united. The motion of the femur being limited, it accomplishes apparent flexion through assistant mobility of the lumbar spine. There are many practical ways of roughly estimating the angle of flexion obtained when there is limitation of function. The degree of this angle should be noted. By flexing the legs at right angles to the femur and grasping it at the knee, the femur can be rotated inward and outward to its greatest extent, and a contrast made between the rotation existing in the right and left hip-joint. By placing the limbs in full extension on the supporting bed or surface employed for examination, the trochanters can next be taken between the fingers and thumb on each side and a contrasting sensation received as to relative thickening of the joint

in the side suspected. There is also the examination of the inguinal glands, measurement of the girth of the thigh, and observation for atrophy, or flattening of the buttock on the one hand, and for thickening due to incipient abscess on the other. With the employment of these measures, the use of the *x*-ray should be rather for the purpose of confirmation and study of the degree of involvement of bone, of cartilage, and of synovia, rather than diagnosis, because the examination physically, if carefully made, should be almost conclusive. It must be remembered however, that as there may be a traumatic synovitis of the knee, so, also, there may be a traumatic synovitis of the hip.

The treatment of the conditions, however, is identical—recumbency, the application of Buck's extension, the elevation of the foot of the bed. The relief of distress and of night cries is usually prompt. At the end of a week or ten days, reëxamination of a traumatic synovitis of the hip should find all symptoms absent, whereas in tubercular involvement the physical signs will be but little affected, if any. In tubercular arthritis of the hip, if the flexion is much, the affected limb may be raised until the lumbar space is obliterated and extension carried out at that angle, with the pulley at the foot of the bed and an incline underneath the affected limb, sufficiently raised to permit it. Toward abduction, since ankylosis in abduction is the method of cure sought, a broad band round the thigh of the affected joint in communication with rope, pulley, and weights at the side of the bed will provide lateral traction.

When acute symptoms have disappeared, if there is deformity of attitude, the patient may be anesthetized, and such correction as

may be gained without the employment of too much force obtained, and a plaster cast applied over proper padding from above the shoetop almost to the axilla with the limb in abduction. If the temperature keeps low and patient does well in all regards, the cast may be removed and a Thomas hip splint applied, with a 2½-inch high-soled shoe on the well leg to avoid weight-bearing, and the patient permitted to walk with the assistance of crutches. Immobilization of this character with avoidance of weight-bearing should be continued until the patient has gone a long period without symptoms of return of this much recurring disease.

There is not time, nor is it the purpose of this paper, to consider the various degrees and varieties of hip-joint disease, and the possibilities of mechanical and operative treatment.

In regard to tubercular joint disease of the knee and the ankle, swelling, limitation of motion and of function, elevation of temperature and—here particularly—the *x*-ray will be assistant in distinguishing tubercular infection from diplococcic and from the rheumatic and the hypertrophic arthritides. Again in the acute stage, recumbency, extension and immobilization are indicated, and when it has passed, the patient may become ambulant with a high shoe on the well side and a Thomas splint on the affected side, assisted by crutches, until—and that will take a long time—there is assurance of the apparent end of the process.

As any one of these topics would require a much longer paper for its fair consideration, only a glance has been taken at the salient features of some topics of orthopedic surgery that may be of interest to the general practitioner.



A Report on the Clinical Use of Radium

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In making a report of the Radium Department at Jefferson College Hospital, it is deemed proper to call attention to some of the earlier work, to point out those cases of interest, and to correct a prevailing idea that the benefit received from this agent is only temporary. In comparing the cases presented for treatment during the last year with those of the earlier years, some advance is shown, due not only to an improved technique, but also to the recognition by the general medical profession of the properties and limitations of radium. There is not the least doubt that in the next decade, by still further refining its application, more favorable results may be expected. The important point appears to be not so much the form of radiation as the manner in which it is applied. A very flexible unit, therefore, is required where the radium can be used in accordance with the requirements of the individual case.

MALIGNANT CASES.

In many of the cases referred to the Radium Department, the distinction between the different classes of tumors is often difficult to make by simply a clinical examination, without the aid of the pathologist. Usually the classification has been made before the case reaches the department, but where there was the least doubt all possible care was taken to check up all the details that could be obtained.

A review of the results as to cure from the employment of this agent in some cases does not appear promising, but cases were not selected, and each one was given a chance, even when the issue was a foregone conclusion. Two cases, illustrating this point, were referred for treatment and died within twenty-four hours; yet these moribund cases are not to be rejected, for even if the result is only temporary, the comfort given to them is certainly to be

considered. Such an instance occurred in a case referred by Dr. Rehfuß and Dr. Rugh. A young man suffering from a sarcoma of the pelvis had been under the influence of narcotics for months and, after the application of radium, lapsed into almost a coma for several days; then gradually recovered from his drowsiness and became perfectly clear and rational. Since then he has experienced little or no pain. These unusual cases make the rejection of even the moribund a decided hazard.

To show the permanency of the result obtained from treatment, several cases are now upon our records that are a source of pride—for instance, Case No. IV, a physician suffering from carcinoma of the larynx, referred to the department on February 8, 1915, by Dr. Edward Watson. The patient has been seen recently and has been perfectly well since treatment. This case was well advanced and had some difficulty in talking. While there still remains some huskiness of the voice, there now is no discomfort.

Another case, No. 143, referred by Dr. Chevalier Jackson, recovered from the disease, but died shortly afterward from an attack of angina pectoris, entirely independent of the malignant disease of the throat.

There are several other throat cases upon the list that have recovered, but the three-year period has not been reached, although so far no recurrence has been observed.

All these cases were treated by the cross-fire method, care being taken not to produce too severe skin reaction, and to guard against too severe reaction of the mucous membrane of the larynx, which appears to be especially susceptible to radiation.

Through the help and interest of Dr. Chevalier Jackson and Dr. William H. Spencer, cases of carcinoma of the esophagus have been given special study. Several different applicators have been devised for the intro-

duction of radium into the masses, and, considering the inaccessibility as well as the irritability of the surrounding tissues, the results have been surprisingly good. Of the six cases that came under observation, two died of pneumonia shortly after treatment, possibly due to exposure in their naturally weakened condition; two others showed no improvement; while in two the conditions showed remarkable temporary improvement, so pronounced that they were able to eat solid food, even meat. Of the last two, one is still living, while the one referred by Dr. William Evans died of apoplexy.

While in no instance has there been a complete disappearance of disease in these esophageal cases, yet the improvement observed has been sufficiently pronounced to maintain our interest in the hope that by improved technique we may be able to combat it successfully; at least in early cases before the disease has passed beyond control.

Conditions of a kindred nature have also been given attention. The results from keloid have, as a rule, been exceptionally good, and this fact having been observed by Dr. William H. Spencer, investigations have been started in the treatment of these dense fibrous strictures of the esophagus, so often observed in children, and caused by the accidental swallowing of caustic. Here again the same conditions are apparent. The surrounding tissues, as well as the scar, are so sensitive to trauma and radiation that the applications must be made with the greatest possible care.

The results in treatment of carcinoma of the uterus show a marked improvement, compared with previous years, owing to the class of cases treated and improved technique. When this department was first opened only such cases as were absolutely hopeless, and there was nothing to offer by other forms of treatment, were referred here. Yet even from this class such results were obtained that to-day radium is applied in the early cases as well as the inoperable, with a decided improvement in the records of non-recurrence.

The effect on other pelvic structures has not been so good as that obtained in the uterus; although several cases of malignancy of the bladder and urethra have shown marked improvement. Case 60, December 14, 1915, epithelioma of urethra, still remains in perfect health, and one still under treatment has shown marked improvement. Several rectal cases have been under observation—one for three years and one for five years. Another case, No. 417, was a woman referred by Dr. Gibbon, and still under treatment, whose disease was far advanced, with profuse bleeding and severe pain. The mass has contracted until there remains only a hard fibrous ring, and while there is still some disease the woman is comfortable and free from bleeding.

The mouth has always been a most difficult part of the body to treat successfully, especially when the disease attacks the tongue or the mucous membrane overlying the alveolar portion of the jaw. Yet in those cases in which the tissues have not been severely injured, good results have been obtained. An instance might be mentioned. A physician, Case 313, August 2, 1919, seventy-six years of age, referred by Dr. Gibbon, with a mass under his tongue the size of a horse-chestnut, has shown no recurrence.

The usual case coming into the department for treatment has advanced to such a degree that improvement is only temporary, although at times results are most surprising. Case No. 186 is typical. A large fungoid mass surrounded an opening about an inch and a half in diameter in the cheek. The man's general condition was bad. It was impossible to keep the wound clean, yet under these conditions the disease disappeared and the man has regained his health. This case first came under observation in January, 1918, and was under treatment until early in 1919. Illustration No. 1 shows the present condition. Another case, No. 1640, somewhat similar, where the disease had broken down the tissue of the cheek from within until there was a small opening upon the cheek, fortunately

healed, and while under observation since 1914 has had no recurrence. Illustration No. 2 shows the result obtained and the condition of his face after a period of six years.

Epitheliomas upon the face, when seen early, usually react favorably to any form of radiation; therefore few have been referred to the department for treatment. There are certain portions of the face, as the lip, ala of the nose, and the mucocutaneous junction of the eyelid, where the disease shows a marked tendency to recur, and these cases appear to react better to radium. It will be noted that these cases, like those upon the mucous membrane of the mouth, recur usually in or near the original site, while those upon the skin recur at distant points and appear to be quite independent of the original ulceration. Pictures 3, 3a, 4, 4a, 5 and 5a are given as illustrations. The recurrence in scar tissue is always more serious, as the blood and nerve supply is altered.

Cases of sarcoma are unusually refractory to all forms of treatment. The tendency of the disease to become widely scattered through the body lowers the chance of ultimate recovery, and while temporary results are frequently seen recurrence is to be expected. In fact, a number of cases have been observed in which a small nodule, supposed to be inflammatory or tuberculous, was treated by radiation with prompt and complete disappearance, only to return within a year or two upon some distant portion of the body. It would seem that where a nodule is treated and disappears rapidly and completely, it should be regarded as a sarcoma until proved otherwise. Tuberculous nodules reduce slowly and usually leave a small, hard scar. Several cases of sarcoma treated in previous years still remain under observation. One, a girl ten years of age, referred by Dr. Rugh, in the spring of 1919 had the sacrum involved and considerable bone destroyed (Fig. 6). Yet when the growth disappeared the structure of the bone was restored, and

the x -ray plate, as seen in illustration 6a, shows it as practically normal. Another, a case of sarcoma of the antrum, occurring in a physician, came to our notice about five years ago. The disease had displaced the eye upward and outward, the whole side of the face was swollen, and the roof of the mouth was displaced downward. For the last two years he has enjoyed good health, his face has returned to its normal contour, double vision has disappeared, and the only permanent injury is a hole between the nose and mouth, which is covered by a plate similar to that used for false teeth.

BENIGN CASES.

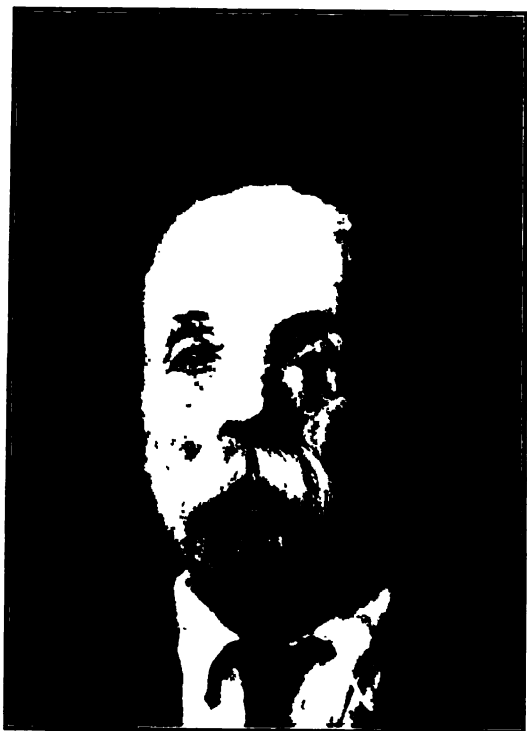
The most interesting groups in this class are those of fibroid uterus and hemorrhage due to various causes, some of which are difficult to determine, especially where a profound anemia, heart, kidney or lung complication render an operative procedure impossible. Here radium has been able to control the hemorrhage and allow the individual to recover from the debility which it has caused. Further corrective measures, impossible before, can then be employed. These cases have enlarged the field of radium to such a degree that to-day it is almost supplanting the older forms of treatment.

Several of the fibroid cases treated in 1915 are still under observation and have shown no tendency to give further trouble. They all represent the class of case in which operation was impossible. In one instance the anemia was so grave that the woman was practically confined to bed. She has since been able to carry on her usual vocation.

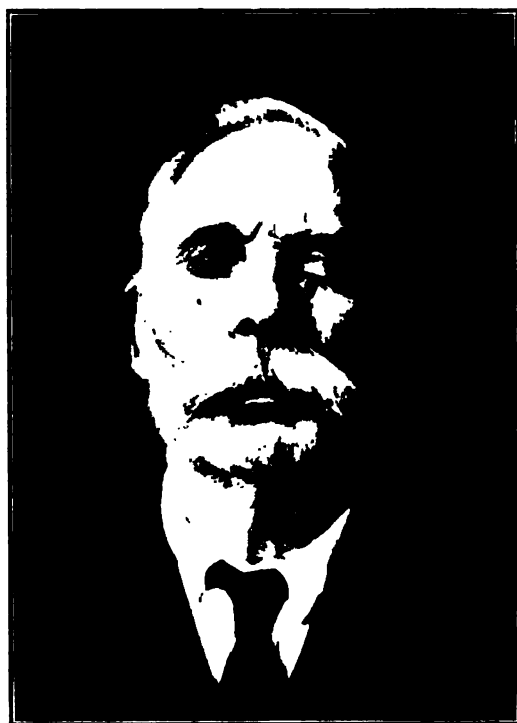
Dr. P. Brooke Bland submits the following report:

"Twenty-two uterine conditions were treated, classified as non-malignant. The applications in these cases were made to control hemorrhage either of inflammatory or benign metaplastic origin.

"In all of these the result was most gratifying and symptomatic cure was obtained. No patients of this number



No. 4.—Case No. 386. Epithelioma of the lower eyelid treated by electric methods.



No. 4a.—The application of radium caused the ulcer to heal. Contraction of the lid due to the scar.



No. 5.—Case No. 402. Epithelioma of the forehead. These cases can be treated by the x -ray with good results. Radium is easier to employ in the nervous or restless patient.



No. 5a.—Case No. 402 after treatment with radium.

required subsequent operation. One application was sufficient in all but one. This patient required three treatments of 2400

It is not necessary to review the cases of angiomata, as they have lately been the subject of two articles. Although many of the cases treated in 1915 and

marked improvement in the general health occurred."

No. 6a. Sarcoma of the sacrum. Notice the reconstructed bone. Treatment consisted of the embedding of 100 milligrammes of radium for 24 hours, and later by cross-fire from the posterior surface and rectum.

Case No. 82, a physician, suffering from a tuberculous sinus of the chest wall for many years, and various forms of treatment having failed, after being treated by radium the wound healed and he was able to serve through the late war in active field duty. Other cases of kindred nature were treated, especially the enlarged glands, but the results in these cases do not seem to differ materially from the x-ray.

	Improved.	Unimproved.	Did not return.	Total.	Remarks.
Carcinoma and Epithelioma.					
Axilla.....	1		1		
Breast.....	3		3		3 cases of local recurrence in the operative scar.
Cheek.....	2	1	3		1 in a woman in advanced age.
Cheek and nose.....	1		1		
Chin.....		1	1		
Cervix.....	4	1	5		
Ear.....	1		1		3 still under treatment.
Face.....	1	1	2		Unfavorable case under treatment, 1916; disease held in abeyance for several years.
Finger.....	1		1		
Forehead.....			1		Still under treatment.
Hand.....	1	1	2		
Head.....	1		1		
Jaw.....	1	2	3		8 still under treatment.
Larynx.....	2	2	4		2 still under treatment.
Lip.....	2	1	3		1 still under treatment.
Mouth.....	6	1	7		2 still under treatment.
Nares.....		2	2		
Nasopharynx.....	1		1		
Nose.....	1		1		
Neck.....	2	1	3		1 still under treatment.
Esophagus.....	2	4	6		2 still under treatment.
Parotid gland.....	1		1		
Pharynx.....	1		1		
Pelvis.....	1		1		
Prostate.....	6	2	8		7 still under observation.
Sigmoid.....	2	2	4		1 improved case still under treatment; other died of pneumonia.
Stomach.....	2		2		
Temple.....	1		1		1 still under treatment.
Throat.....	1	2	3		1 still under treatment.
Tongue.....	1	3	4		2 still under treatment.
Tonsil.....		1	1		
Urethra.....	1		1		
Uterus.....	7	10	17		10 unimproved includes those cases that were temporarily benefited by checking of hemorrhage and discharge.
Other pelvic structures.....	4		4		
Vagina.....	2	1	3		
Papilloma of bladder.....	1	1	2		
Sarcoma.					
Abdomen.....		1	1		
Cheek.....	1	1	2		
Chest.....		1	1		Still under treatment.
Elbow.....		1	1		Still under treatment.
Femur.....	1		1		
Foot.....	1		1		
Groin.....	1	1	2		
Heel.....	1		1		
Hum.....		1	1		
Jaw.....	3	1	4		
Leg.....	3	2	5		
Maxilla, superior.....		1	1		Still under treatment.
Neck.....	1	5	6		1 still under treatment (Hodgkin's disease included in this group).
Orbit.....		1	1		Still under treatment.
Scapula.....	1		1		
Shoulder.....		1	1		
Vagina.....	1		1		

	proved.	Improved.	not return.	Total.	Remarks.
Sarcoma.					
Endothelioma nose.....		1		1	
Fibroadenoma bac.....		1		1	
Osteochondroma merus.....			1	1	Still under treatment.
Unclassified.					
Hemangioma:					
Cheek.....		1		1	
Face.....		6		6	
Forehead and bei.....		1		1	
Forehead.....		4		4	2 still under treatment.
Hand.....		2		2	2 still under treatment.
Head.....		1		1	Still under treatment.
Knee.....		1		1	
Lip.....		4		4	
Mouth.....		2		2	
Thumb.....		1		1	Still under treatment.
Tongue.....		1		1	
Lymphangioma che.....		1		1	
Pigmented angioma.....					
Back.....		1		1	
Cheek.....		1		1	
Nose.....		1		1	
Parotid tumor.....		1		1	
Keratosis nose.....		1		1	
Leukoplakia.....		1		1	
Keloids:					
Arm.....		2		2	
Face.....		1		1	Still under treatment.
Neck.....		1		1	Still under treatment.
Hyperthyroidism.....		2		2	2 still under treatment.
Anemia.....					
Leukemia:					
Lymphatic.....		2		2	
Myelogenous.....		1		1	1 still under treatment.
Enlarged spleen.....		3		3	Temporary improvement for about 2 years.
Enlarged lymph gland.....		3		3	
Tuberculous laryng.....		1		1	
Arthritis.....		2		2	Still under observation.
Sinusitis, frontal.....		1		1	Still under observation.
Traumatic ulcer.....		1		1	
Fibroid uterine.....		12		12	2 result undetermined.
Metritis.....		4		4	2 result undetermined.
Menorrhagia.....		3		3	1 result undetermined.
Oophoritis.....		1		1	
Totals.....				340	

During the last year 193 new cases, and 48 continued from previous years, were treated. These cases required 1343 applications, varying in length from one-half hour to seventy-two hours, and totaled 497,576 milligram hours. The results have been classified under two heads—improved and unimproved (neither list presents the actual facts without analysis). No doubt many malignant cases in the improved column will present recurrences, due mainly to the character of the disease; yet even if the result be temporary the relief from pain and other accompanying symptoms has justified their being placed under that heading. There are also many in the unimproved column who were temporarily benefited in previous years. Those cases still under treatment where the result at the present time is doubtful are placed in the total column, unclassified. So long as the

disease remains local, there is a good chance of recovery, but metastasis is extremely difficult to detect and enlarged glands do not always mean malignancy, especially where there is an open ulcer. The list therefore represents the cases as they came to the department for treatment.

In closing, I wish to express my gratitude to our generous donor, Mrs. M. H. Henderson, to the members of the Radium Committee, and to call attention to the careful work done by our technician, Miss Katherine Sheaffer. Without their assistance this work would have been impossible.

The Modern Treatment of Syphilis¹

BY FRANK CROZER KNOWLES, M.D.

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The treatment of syphilis has undergone a radical change since the discovery of the cause of the disease by Schaudinn and Hoffmann in 1905; the application of the test devised by Wassermann, Neisser and Bruck in 1906; and the original salvarsan preparation of Ehrlich, first used therapeutically in 1910.

Originally the pill method of mercury administration was the one and only thought, with a four years' continuous course of medication; then came the dirty but efficient inunction method; and later the intramuscular injections came into vogue.

With the advent of the Ehrlich product the pendulum swung the other way. Here was the cure of syphilis in one dose and nothing further would be required. Again, as with so many of our hopes, a change was required; instead of one, several doses proved necessary. Mercury was all but forgotten, and absolute reliance was placed on this arsenical combination. It was found, however, that nerve manifestations of syphilis were becoming more frequent when this drug alone was given. Again the pendulum has swung backward, and an equal reliance is now placed on mercury; and a combined treatment with these two drugs is considered the *sine qua non* of syphilis.

What is the present status in the treatment of syphilis, and what do we endeavor to accomplish? Our ideal is to kill the or-

ganisms that cause the disease and to get the individual back to perfect health.

The treponema pallidum is destroyed in two ways: either by the direct action of the drug on the organism or by the formation of certain substances in the general economy which have a lethal action on these germs, or that so increase the resistance of the tissues that the causal factor becomes innocuous.

In a recent publication Highman states the following: "Arsphenamine should not be regarded purely as an arsenical compound, but roughly as analogous to an artificially produced antibody capable of destroying spirochetes. Hence it is distinctly a spirocheticide."

Highman also states: "Mercury may be a parasiticide, or it may stimulate immune body formation in the host, or it may do both. In any case there is reason to believe that its effect in syphilis is due as much to its influence on the host as on the invader."

We therefore have two drugs for the treatment of this disease which have a lethal action on the causative organism.

The iodides act in an entirely different way from arsphenamine and mercury, and their use should be confined to the healing of the broken-down lesions of the late stages of the disease. According to Jobling and Petersen, "iodine neutralizes the action of the agents which prevent resolution and absorption of the diseased necrotic tissue, and at the same time lays bare to the action

¹Read before the Section on Otolaryngology of the College of Physicians, February 16, 1921.

of the real germicidal agent the infecting organism which previously had been protected by necrotic tissue."

Knowing the drugs that are indicated in this disease we have to decide as to dosage, the soluble or insoluble combinations, intervals between doses, and the course of treatment required.

Arsphenamine is usually given to the average adult in an initial dose of 0.4 gramme; the following injections are frequently of the so-called full strength, 0.6 gramme. The usual interval between injections is approximately one week.

Neoarsphenamine has practically the same action, but is given with a starting strength of 0.6 gramme and continued at weekly intervals with an approximate dosage of 0.9 gramme.

The latter preparation is infinitely easier to give, as diluting with a few Cc. of distilled water is all that is necessary. Approximately five injections of this preparation are necessary as compared with three of arsphenamine.

There is a marked diversity of opinion as to the number, strength, and frequency of these injections that are necessary. Pollitzer formerly recommended giving three intravenous injections of 0.6 gramme of arsphenamine on three successive days.

Fordyce recommends a course of five or six injections, 0.4 gramme of arsphenamine, at intervals of from one to two weeks.

Hazen administers a course of 0.4 gramme of this drug, four injections at intervals of three to five days, and four others at weekly intervals.

Our selection of the mercurial preparation to be employed is somewhat more difficult, and has to be based largely upon whether we desire a quick or more prolonged action and as to the pain associated with the intramuscular injection.

The soluble compounds of mercury have to be administered approximately each day or every other day, and as the injections are frequently painful most of us give our allegiance to the insoluble salt.

The recent work of Cole, Littmann, and Sollmann, on "A Study of Mercury Injec-

tions by Means of the Roentgen Ray," has proven illuminating. Their findings are of considerable help in regard to the preparation which is most efficiently absorbed and the length of time required for this to occur. They found that the salicylate of mercury injected into the gluteal muscles required on the average four days for complete absorption; calomel fifteen days; and gray oil forty-three days.

The salicylate of mercury is therefore the drug of choice, as it is having a continuous action for four days, while the other insoluble compounds are absorbed so slowly that an insufficient quantity is taken into the general system during a rather indefinite absorptive period.

Pollitzer, Fordyce and Hazen recommend a course of twelve injections of an insoluble salt of mercury. The latter, however, starts his treatment with one injection of a soluble salt, followed the next day by an insoluble preparation.

The most frequently employed preparation of this drug in the United States is the salicylate of mercury. The interval between dosage, five to seven days, which most of us have used, has evidently been correct, for the experiments of Cole show that absorption of this salt is approximately completed in four days in an average individual.

Treatment in the primary and secondary stage of the disease is the same, and the following procedure is suggested: Three weekly intravenous injections of arsphenamine, with a starting dose of 0.4 gramme and those succeeding of 0.6 gramme, for an average-sized adult; or five weekly injections of neoarsphenamine, the first dose being 0.6 gramme and those that follow 0.9 gramme; giving at the same time ten doses, at weekly intervals, of one or two grains of the salicylate of mercury. After finishing this cycle of treatment, wait two weeks and repeat. One month after finishing these two courses of treatment a Wassermann test should be made. If this test is negative, stop treatment. The patient should have a Wassermann test made every three months during a period of one year, with-

out treatment. If the test is returned as negative during this period, the luetin reaction gives no response, and the spinal fluid shows no abnormality, the patient may be considered cured.

If, however, the Wassermann test gives a positive reaction after the two courses of treatment, the two cycles of injections should be repeated. This test remaining positive after the four series of treatment, two courses of treatment should be given each year with several months' interval between the treatments.

In these Wassermann-fast cases intraspinal medication, as advocated by Fordyce, may be considered. Arsphenamine

injections have also been given at lesser intervals with reported favorable results. The treatment in the late stages of the disease is the same, excepting that the iodides may be given, in addition, for absorption of the broken-down lesions.

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Prognosis and Treatment of Scarlet Fever

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The prognosis depends upon:

1. Amount of poison that has been absorbed.
2. Whether the child is weak and delicate or strong and robust.
3. The occurrence of complications, especially cardiac, pulmonary, renal, and otitic.

Very high temperature indicates a bad prognosis. The younger the child the graver the prognosis. Mortality is estimated at from 20 per cent to 30 per cent in children under five years of age.

Causes of death:

1. Scarletinal toxemia.
2. Nephritis.
3. Brain abscess from extension.

The best prophylactic treatment is the removal of enlarged and diseased adenoids and tonsils.

Put patient to bed, and report case to the health authorities to be placarded until desquamation is complete, and all discharge from the nose and ears has ceased. Give an initial course of calomel followed by a purgative. Treat the temperature

hydrotherapeutically—i.e., sponge baths, colonic irrigations, ice-bags, etc. In cases of very high temperature, and especially with diminution of urine, once a day wrap the child in a blanket and place it in water at a temperature 90° to 95°; keep it there for from ten to twelve minutes; take out of wet blanket and place in dry blanket, and give inunction of cacao butter. Try to have two rooms, one for day and one for night, preferably with a sunshiny exposure. Keep temperature of rooms 68° to 70°. The child should have its own dishes. Disinfect everything before it leaves the room—i.e., sheets, pillow-cases, towels, and everything used for the patient—in bichloride of mercury solution 1:500 or phenol solution 1:50; also the urine and feces, which should be collected in a bed-pan containing equal parts chloride of lime and strong vinegar. So far as possible use materials that can be burnt. Diapers could be made of old sheets, and napkins could be made of paper. Hang a sheet at the door and keep it wet with either of the solutions mentioned, as this will catch the dust from

the outside and infected material from the inside of the room. Sprinkle one of these solutions on the floor, or mop once or twice a day. Have a gown and cap hanging at the door and a pair of rubber overshoes for your own use. Take the gown off at the door of the sick-room, and have it disinfected between visits. When you leave the room, go to the bath-room and wash the hands and face in a weak bichloride solution. Itching is very troublesome during desquamation in scarlet fever, and for this use warm baths followed by cacao-butter inunctions. Do not use phenolated ointments, as it is claimed that the absorption of the carbolic acid present in such ointments might act as an irritant to the already irritated kidneys. However, I believe this theory is rather far-fetched, (1) because the amount of phenol present is so small, and (2) the absorption on the part of the skin in cases of scarlet fever is so slight.

The diet should be liquid and nourishing. If the child is breast-fed, have the milk pumped from the breast and fed to the child. If a bottle baby, dilute one-half with water if on straight milk, because whole milk constipates and causes tympanites, or give half milk and half Vichy water, because alkalies help to neutralize the acidity, which is one of the causes of the nephritis. Orange juice is very beneficial. Lemonade is good, especially if one adds to every pint one drachm of cream of tartar. Cereals may be cautiously added, and water should be given freely. Avoid the use of salt and exclude soups and bouillon from the diet.

As to the toilet of the nose and throat: Swab, spray, or gargle with alkaline solution, according to the age of the child. If the patient be old enough to gargle, this should be done; if, on the other hand, it be too young for that, but old enough to open its mouth and put out its tongue when told to do so, then swabbing may be employed, while, if it be too young to do this, spraying with an atomizer would be better. Potassium permanganate gr. ss,

water $\frac{3}{4}$ j, is a good solution to use four times a day. Do not use potassium chlorate for the sore throat because of its well-known irritating effect on the kidneys, should any of it be swallowed or absorbed. After using the alkaline solution instil a few drops in each nostril of an oily preparation, such as

R Menthol, gr. x;
Phenol cryst., gr. ij;
Ol. eucalypt., f $\frac{3}{4}$ ss;
Liq. alboleni, q. s. f $\frac{3}{4}$ ij.

My advice is to use little medicine and lots of water. The one and only drug usually necessary to employ is potassium citrate in 2- to 5-grain doses, or liquor potassii citratis 15 to 20 minims, three times a day. Do not use nitre too freely. The skin in scarlet fever is not active, and therefore there is no use for a diaphoretic, and as for a diuretic, remember there is probably already damaged kidneys. If renal inflammation develops, poultices applied over the kidney region may do good. Make flaxseed poultice with 16 parts flaxseed and 1 part mustard, or 4 parts flaxseed and 1 part digitalis leaves. Put on every four hours during the day, and keep on hot for half an hour. For stimulation, when needed, caffeine-sodium-benzoate in $\frac{1}{2}$ -grain doses hypodermically is among the best. Digitalis and strophanthus, the latter especially in very young children, may be employed by mouth.

The value of antistreptococcic serum is doubted and its use is limited. There are certainly several conditions where one would not use the serum:

1. In cases with very high temperature.
2. In very young infants or patients who are greatly exhausted from the effects of the disease.

If indicated, use 20 to 40 Cc. every four to six hours. The prophylactic dose to others is 10 Cc., but a single inoculation does not confer immunity, and immunity, when present, does not last over six months.

Be careful to disinfect the mail going from the house, using dry heat, and keep all animals out of the sick-room during the

illness, as they are great carriers of the infection.

Be always on the lookout for complications, and remember that otitis may develop and be the cause of considerable fever without any pain being present.

A daily examination of the urine should be made.

Always bear in mind that chicken-pox may complicate scarlet fever.

A physician should not attend an obstetric case while in attendance upon a patient suffering with scarlet fever.

Improved Incision for the Operation of Sectioning the Pyloric Sphincter.

BUTLER (*California State Medical Journal*, January, 1921) notes that the epigastric rectus or midline incision is the usual portal of approach in performing the Fredet Rammstedt operation (section of the pyloric sphincter). The closure of these incisions is fraught with many technical difficulties that tend to prolong the time of operation and resulting often in various postoperative complications.

As soon as the peritoneum has been sectioned, the greater omentum and collapsed small bowel protrude through the wound, and their replacement and retention is often difficult. At times the fine web-like omentum is torn, producing holes in this curtain-like structure that loops of bowel may slip through and years later cause intestinal obstruction.

Particularly is the omentum troublesome during the closure of the peritoneum. It clings to the suture material and pokes out between the stitches, sometimes escaping the notice of the surgeon, and adheres to the edges of the fascia, thus preventing proper healing, and predisposes to early rupture of the wound or later to postoperative hernia. These little omental herniæ not only produce weakened areas in the wound, but often strangulate, and are the cause of postoperative vomiting that is

credited to other factors. The fine web-like omentum is one of the bugaboos of infant abdominal surgery.

The improved incision, called "the flood-gate incision," for want of a more appropriate name, does away with the above described difficulties and complications. This incision is made over the quadrate lobe of the liver above its free margin. The quadrate lobe extends lowest about 2 cm. to the right of the midline; a longitudinal incision 5 cm. in length, located 2 cm. to the right of the midline and above the free margin of the quadrate lobe, gives ample room for the muscle-splitting procedure. This incision may be completed while the child is straining without any hollow viscera or omentum escaping; the liver moves with respiration and bulges slightly into the wound if the abdominal muscles tighten. This incision is particularly useful when operating under local anesthesia.

The dorsal surface of the operator's left index-finger slipped into the wound easily displaces the "flood-gate," the quadrate lobe of the liver, superiorly. The pylorus lies directly posterior to the quadrate lobe and is easily grasped between the index-finger and thumb of the operator's left hand and elevated through the wound.

The splitting of the pylorus is not difficult if the scalpel be laid aside after an incision is made through the serosa and the more superficial fibers of the pyloric muscle. Into this fissure the closed tip of a mosquito clamp is forced and the shafts separated as in the process of blunt dissection. The hypertrophied muscle tears readily down to the mucous membrane. Care must be taken not to open the duodenum; its muscular walls are underdeveloped, quite in contrast to the hypertrophied gastric musculature.

The splitting completed, the pylorus retracts, the liver glides down, completely blocking off the abdominal hollow viscera and omentum from the wound, and a rapid, careful closure, layer by layer, may be made.

Editorial

THYROID GLAND THERAPY.

At the present time when the employment of various endocrine glands is being resorted to in rather a haphazard manner, and when certain clinicians are publishing enthusiastic reports while others are failing to obtain results of any value, it is well for the average practitioner to occupy a judicial position. While on the one hand he should hold himself open to all information which may accrue, on the other hand he must not be guilty of administering organic substances which may do harm as well as good in view of the limited knowledge which he possesses as to the influence exercised by these glands upon the function of their fellows.

Just as diphtheria antitoxin has proved itself *facile princeps* as compared to all other antitoxic serums, so has the use of thyroid gland achieved this position in endocrine therapy. While it is perfectly true that in a lifetime of active practice a medical man may not meet with a well-developed case of myxedema or cretinism, it is true that larval forms of these two conditions occur much more frequently than has heretofore been recognized, and that the physician who keeps his eyes open for such modified forms will often obtain excellent results from the use of thyroid gland.

Many of the glands of internal secretion are destroyed when they enter the stomach and so are prevented from exercising their ordinary physiological influence, but this is not the case with the thyroid. From the first, however, it has been recognized that whether the crude gland itself, or some dried product, or some extract of it, is used, the physician has an uncertain remedy because its physiological activity cannot be standardized, so that the physician has been somewhat in the position of

the medical man who was forced to use cinchona bark before quinine was introduced.

In this connection it is to be recalled that comparatively recently Kendall has been able to isolate what is, to all intents and purposes, from every aspect the active principle of the thyroid gland, has determined its dose, which is relatively very small, and has therefore placed in the hands of the profession an accurate method of therapeutic procedure in those cases in which thyroid gland has heretofore been considered indicated. Kendall's investigations are not only of importance for the reasons just given, but also because they lend encouragement to the hope that he, or other chemists, may be successful in isolating from other glands of internal secretion their active principle, as Takamine did years ago in the case of adrenalin. It is pleasant to note that the Board of City Trusts of the City of Philadelphia, acting under the will of John Scott, who died in Edinburgh, Scotland, in 1816, has recently awarded to Kendall the John Scott medal and a premium of \$800 for his investigations, the medal being inscribed with the words dictated by the testator, "To the most deserving." While the Board of City Trusts, acting under the will of John Scott, made the award, it was done on the recommendation of a committee of notable scientists representing the National Academy of Science, the American Philosophical Society, and the University of Pennsylvania.

In this connection it is interesting to note a case recently reported in the *New York Medical Record*, which illustrates very well the fact that persons needing thyroid in the vast majority of instances need it for a lifetime. Thus Hardenbergh has reported the case of a woman who received thyroid feeding for a period of twenty-six years, the

patient learning, in the course of time, how to adjust the dose to her needs at a given period, and finally getting her condition so well under control that one or two tablets weekly, three to six weekly, or a few more were only necessary to keep her in excellent condition. Possibly there are other cases not reported in which thyroid has been taken for an equal length of time, but as Hardenbergh says, "it would appear that this instance is practically unique."

PROTEIN FOOD AND BLOOD-PRESSURE.

For a long time many persons have believed that in the presence of a high blood-pressure it was essential to regulate the diet in such a manner as to exclude animal foods to a very large extent, and we believe that a very considerable number of patients have been unnecessarily deprived of an essential part of the diet for the maintenance of nutritional equilibrium as a result of this idea.

In a recent issue of the *American Journal of the Medical Sciences*, Mosenthal points out that it is remarkable what very meager evidence can be brought forward in support of this notion. It is true that some observers have shown that placing a patient upon a low protein diet results in a distinct fall of blood-pressure, but this does not prove that a protein diet produces a high blood-pressure. Depriving a boiler of fuel would result in a fall of steam-pressure, but it does not necessarily follow that a normal amount of coal placed under it would result in producing a pressure in the boiler which would be anything above normal.

In order to investigate this matter, Mosenthal studied a number of patients, who had been in bed for several days, with the sphygmomanometer. He confirms the view that a low protein diet may lower pressure to some extent, but he regards this as being exceptional rather than constant, and he did not find that a high protein diet raised pressure.

It is interesting to note too that a diminution of the waste products in the blood, as indicated by the lowering of its non-protein nitrogen contents, had no effect upon blood-pressure.

We have often noted that high-pressure patients, with or without definite renal lesions, instead of improving under a low protein diet, have rapidly lost vigor and strength, and if this is true in regard to the general system, there is no reason why it should not be true also in regard to the heart and blood-vessels. The point would seem to be, not that it is necessary to cut out proteins unduly, but to regulate the entire diet list so that the patient will receive a sufficient number of calories from his proteins, fats, and carbohydrates to maintain nutrition without overburdening his digestive system or the organs of excretion. Mosenthal states that an estimation of the hemoglobin percentage of the blood shall be utilized as a gauge as to whether the patient is being properly fed, and insists that the hemoglobin should not fall below 85 per cent if a diet considerably under that which the patient has been accustomed to is instituted.

Closely associated with this question is the communication made by Wordley of St. Thomas' Hospital, London, in the *Quarterly Journal of Medicine*, who undertook to determine whether the excretion of protein in the urine in persons suffering from renal disease had any relation to the amount of protein in the diet. He was instigated to investigate this question by reason of the fact that it is commonly stated that a rich protein diet is harmful in chronic renal disease, and if persisted in leads to an increase in the albuminuria. Naturally he doubted the correctness of this view unless the protein intake is in such enormous quantities as to be excreted unchanged. In his experiments all classes of renal diseases were used and an effort made to determine whether the lesion in the kidneys was stationary and whether the excretory powers of the kidney were or were not normal.

Wordley points out that Maclean's urea test is of the greatest value to separate cases of pure high blood-pressure from those which are due to interstitial nephritis, and he includes in the cases which he studied two instances of high blood-pressure without serious kidney failure. Maclean has shown that in many cases in spite of a rich protein diet the plasma protein remains the same, and suggests that the beneficial effect of a diet containing an enormous amount of protein is to raise the urea content of the blood and thus induce a diuresis.

It is further pointed out that many cases with severe edema show no tendency to urea retention, so that there can be no objection raised to an increase in the blood urea, and the amount of protein excreted in the urine may be ignored. However, it is always wise to estimate the non-protein nitrogen of the blood, and if in any instance it is distinctly above normal some caution will be necessary in the administration of a diet rich in protein. On the other hand, it is to be remembered that in some instances uremic symptoms develop even when the non-protein nitrogen is practically normal.

Quoting Herringham, Wordley agrees with him that a rich protein diet gives rise to no increase in albuminuria after the acute stage is passed. Wordley, therefore, reaches the following conclusion, namely, that variations in the amount of protein in the diet have no effect on the amount of protein excreted in the urine, although the amount of protein in the urine when examined at different times of the day may show a wide variation. He believes that the blood urea varies very considerably with the diet, but that estimations are of much less value in appraising the kidney function than Maclean's urea test. He asserts that the plasma protein may be below normal in cases with no edema, and thus allies himself with those who do not follow the theory that a lowering of the plasma protein is always a cause of edema.

CAUTION IN THE DIAGNOSIS OF DIABETES.

The presence of sugar in the urine being the dominant symptom, in one sense, in the disease known as diabetes mellitus has led many of the profession to make a diagnosis that this grave disease was present when in reality it was not. Forty years ago albumin in the urine was considered to be a sure indication of disease of the kidneys, and while it still remains an important diagnostic sign, nevertheless the actual value of its presence has become materially modified with our increased knowledge. The same thing holds true in regard to glycosuria. While it is a fact that there can be no diabetes without glycosuria, it is also a fact, becoming more and more recognized, that there can be glycosuria without diabetes. It is only when in association with glycosuria, acetone, diacetic acid, or beta-oxybutyric acid appear in the urine, with the symptoms which are characteristic of diabetes, that one is justified in valuing the symptoms, linking them together and so forming a chain which ties fast to this distressing diagnosis.

For many years too it has been recognized that the urine may contain reducing substances other than sugar which may mislead the physician into the diagnosis of a glycosuria and so lay the foundation for the erroneous diagnosis of diabetes. One of the noteworthy instances of this occurred in Baltimore many years ago when a man was refused life insurance on the ground that his urine contained sugar, although it was proved by competent chemists in that city and Philadelphia that sugar was absent and that he was a perfectly good risk.

Our attention is called to this matter once more by a communication made by Mathews, whose book upon *Physiological Chemistry* is one of the standard works upon this subject, his last edition being reviewed in the *GAZETTE* very recently. Mathews points out that it is important to distinguish between the presence of

lactose and glucose in the urine, and that the presence of lactose may reduce Fehling's solution to such a degree as to lead the physician to believe that sugar in very large quantities is present.

Many tests which are employed by physiological chemists require a technique, and a skill in carrying out the technique, which is quite impossible for the general practitioner, but Mathews's advice can be carried out by any one and, therefore, possesses more than ordinary value. As he says, the essential part of the method is to ferment the urine with a large amount of yeast. This results in the rapid disappearance of the glucose, so that its reducing action on Fehling's solution is wiped out, but the lactose remains unchanged in the filtrate. Sugar possesses significance, whereas lactose possesses comparatively little significance. Ten Cc. of urine is measured in a test tube and one-quarter of a cake of compressed yeast is added to it. The test tube is now closed with a cork or by the thumb of the physician, and shaken vigorously until the ferment is well distributed and no longer appears in lumps. The tube is then uncorked and placed at an angle of 45 degrees in a vessel which contains water at between 40° and 43° C., the water being in sufficient quantity to extend above the level of the urine in the tube. At first small globules of air will be seen rising as a result of the shaking, but this soon stops if no fermentation is present, but if glucose or levulose is present there begins very promptly an active fermentation so that bubbles of gas rise to the upper side of the test tube and escape. If the sugar is less than one per cent this bubbling is very slight, but if the amount of sugar is greater than this the bubbling is in direct proportion to its quantity, and if it amounts to three per cent or more, to use his words, the fermentation is stormy. This test is sufficiently accurate to enable one to say that there is more than one per cent of dextrose present and this within five to ten minutes, and so Mathews states that if the urine of a pregnant or nursing woman strongly reduces Fehling's solution but does not give

off gas with yeast, it is certainly not dextrose but is most probably lactose which is present.

A POINT IN REGARD TO THE TREATMENT OF CEREBRO- SPINAL SYPHILIS.

When Ehrlich first introduced arsphenamine, we recall the fact that he believed that one large dose given intravenously would destroy the parasite of syphilis and, thereby, that the patient would be really cured. As the years go by it becomes increasingly evident that not only is this incorrect, but that many doses of arsphenamine often fail to completely eradicate the infection, and it was not long before it was also found that when the parasite had invaded the cerebrospinal system it was either peculiarly resistant to "606" or that "606" was prevented from coming in contact with it. The latter view is now generally held, and it was largely responsible for the method devised by Swift and Ellis whereby the serum of a patient, who had received an intravenous injection, is injected into the spinal canal in order that a small amount of the drug, or antibodies produced in the blood, might have a direct action and relieve the symptoms. It was not long, however, before Bernard Sachs in New York and Dercum in Philadelphia, as well as many others, began to point out that these intraspinal injections of serum did not produce the good effects which had been attributed to them, the changes which occurred in patients so treated being due to the mechanical effect of the injection or to the drawing off of cerebrospinal fluid before the injection was made, and in other cases the improvement in the patient was in reality one of the natural remissions in the course of the disease rather than due to treatment.

It has also been known, almost since arsphenamine was introduced, that this drug is capable of producing, when given intravenously, very severe cerebral symptoms in some patients. This fact was clearly recognized by Ehrlich, who advised that

these symptoms of nervous intoxication should be combated by full doses of adrenalin given hypodermically or intravenously. It was believed that these symptoms in many instances were due to the destruction of the parasites and the liberation of toxins, a condition closely allied to the so-called Herxheimer reaction on the skin. It is now beginning to appear that intraspinal injections of salvarsanized serum, which have usually been considered harmless even if not useful, are capable of producing evil results in a certain proportion of cases, and in a recent issue of the *Archives of Dermatology and Syphilology*, Solomon and Klauder, writing upon this subject, insist that in some instances, even if there is a history of syphilis, and also a history of neurosyphilis which has become latent, this fact does not justify the institution of treatment even if the Wassermann reaction be positive. In other words, it would appear that in such cases it is often best to let "sleeping dogs lie" and not to endeavor by active measures to change a positive Wassermann reaction into a negative one unless the symptoms are so definite or so severe as to justify the physician in taking a certain amount of risk.

In the first place they report cases which show that after treatment the cerebrospinal fluid which was negative became positive, or if weakly positive became very positive, and they cite cases in which it would appear that more harm than good was done by intraspinal injection. Thus in one instance a patient, who had become infected twenty-five years before, presented gastric crises, sphincter disturbances, and numerous other evidences of cerebrospinal disease, when given two injections of neoarsphenamine with a week intervening, and suffered from a severe reaction each time, being confined to bed two days after the first injection and four weeks after the second with mental disturbances, increased pains in his legs, and with difficulty in speech.

In the case of a boy of nine years, with hereditary syphilis, who received four very moderate doses, there was definite left-sided

paralysis two weeks later. As Solomon and Klauder well say, some difference of opinion as to the value of treating patients with latent neurosyphilis will depend on theoretical difference of opinion: "thus there is a school of syphilologists who believe that syphilis is an incurable disease and that all that therapy can be expected to accomplish is the production of a latent condition. Another group, that may be considered as somewhat more optimistic, believes that syphilis is a curable condition and that a great effort should be made to produce negative serology. It is quite obvious, of course, that both conceptions may be carried to a degree that is not rational."

After all the question of how much can be done in syphilis of the cerebrospinal system, or indeed of syphilis of any other part of the body, depends largely upon the duration of the infection and the severity of the lesions that have been induced. This holds true in regard to the use of antitoxin in diphtheria and in tetanus. The point would seem to be that where the manifestations of infection of the nervous system are in abeyance except that the Wassermann test is positive, it may be wise in many instances not to institute treatment with this very active drug.

THE ABDUCTION TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR.

This treatment, concerning the advantages of which and its proper technique WHITMAN (*New York State Journal of Medicine*, December, 1920) has been writing and demonstrating for the last ten years, and which should by this time be the recognized and conventional method of procedure for fractures of the neck of the femur, has not yet broadly supplanted the older treatment which has proven to be entirely ineffective, and which is invariably followed by a degree of crippling which can be greatly lessened. The points which Whitman in his latest article emphasizes are these:

The abduction treatment is not, as it is often designated, a plaster-of-Paris method as contrasted with other splints; nor is it a splint method as opposed to traction. Its mechanism is the anatomy of the hip-joint, and the limb is fixed in the attitude that makes the internal splinting effective. It is not an alternative to any form of conventional treatment because it is unhindered by the qualifications and restrictions to which they must conform. It is the only method by which the surgical principles that govern the treatment of all other fractures may be consistently applied, and in establishing these principles it must of necessity displace inadequate methods, and in natural sequence the entire structure of accepted teaching and practice of which they are the basis.

Conventional treatment, both in theory and in its practical application, is a pretentious sham, and that it is not more generally recognized as such is a striking illustration of the influence of custom and tradition as opposed to reform.

The abduction method utilizes the mechanics of the joint to correct deformity and to fix displaced fragments in apposition, consequently it is the only treatment by which surgical principles may be consistently applied.

The patient, under anesthesia, is placed upon a pelvic support provided with a perineal bar. If the fracture is complete, the trochanter having been lifted to the normal plane, the shortening is reduced by direct manual traction on the extended limb, which is at the same time rotated inward, thus opposing the fragments. Both limbs, extended and under manual traction, are then abducted to the full limit, on the sound side first, to demonstrate the normal range and to balance the pelvis. When this limit is approached on the injured side the tension on the capsule aligns the fragments in a horizontal plane, and finally forces the neck fragment against the inner and resistant head fragment. This mutual pressure, the first essential of stability, is further assured by the inclusion of the line of fracture within the acetabulum

by the apposition of the trochanter and the side of the pelvis, and by the muscular impotence incidental to complete abduction. A long plaster spica is then applied, which, by fixing the limb in complete abduction, extension, and slight inward rotation, insures the continued effectiveness of the anatomical splinting.

If the fracture is incomplete or impacted, the neck, in its relation to the shaft, is usually displaced backward and downward, and whenever the deformity is sufficient to seriously impair the normal range of motion it should be corrected. In most instances, by the manipulation described, the shortening of the so-called impaction may be as easily reduced as if the separation were manifestly complete. If, however, the resistance is greater, as in the incomplete fractures of childhood or when treatment has been delayed, manual traction is supplemented by downward pressure on the protecting trochanter and more effectively by natural leverage. For since the range of normal abduction is dependent upon the upward inclination of the neck of the femur, its depression must limit abduction by contact with the upper border of the acetabulum. This contact fixes the neck, and by the leverage of the extended limb against this fulcrum the limb may be abducted and rotated inward to the required degree.

In other words, the displaced neck is in a relation to the acetabulum which under normal conditions would require abduction and inward rotation of the shaft. To correct the deformity, therefore, one must adjust the shaft to the neck by inward rotation and abduction of the limb. The plaster spica is then applied, assuring immediate fixation. Correction of deformity in this manner, far from jeopardizing repair, is the most effective means of promoting it, since restoration of the normal contour apposes the fractured surfaces which were separated by the distortion.

The subsequent treatment is the same for all forms of fracture. The head of the bed is raised one or two feet, an inclination which, as contrasted with that required for

traction, is far more comfortable, and because of its influence on the blood supply more favorable to repair. The patient may be turned from side to side or completely over to the ventral position, without discomfort or danger of displacement; thus bed-sores and hypostatic congestion may be prevented. If feasible, patients may be transported daily to the open air, and fixation in the abducted attitude even permits locomotion without injury, as has often been demonstrated by young and unruly subjects. The spica is retained for from eight to twelve weeks, or until it may be assumed that union is sufficiently firm to permit movement of the limb. On its removal the patient should remain in bed, devoting, if possible, several weeks to muscular re-education and to the restoration of motion in the disused joints, the limb being drawn out to the limit of abduction at regular intervals by the attendant. Weight-bearing is not permitted until free and painless movement and *x*-ray examination indicate stability of repair. Thus, what may be termed the physiological treatment of fracture of the neck of the femur of the ordinary type is rarely completed within a year, and if early locomotion is desired a protective hip-brace should be provided.

It may be noted that the abduction treatment is conducted with a definite purpose, the initial attainment of which may be demonstrated by *x*-ray examination at the time of the operation and at intervals thereafter, and that from beginning to end the patient is under single control. It was originally devised for the treatment of fracture of the neck of the femur in childhood, after it had been demonstrated that these patients suffered the same penalties for inadequate treatment as older subjects, and in its evolution technical efficiency has remained the first consideration. For this reason doubtless it has often been criticized as adapted only to the young and vigorous. The contrary is the fact, since this method, which permits frequent changes of posture, has a far wider range as regards age and infirmity than those which require a persistent dorsal position. Indeed, it may

be even more conservative than non-treatment, since it relieves pain and prevents bed-sores. From the standpoint of practicability it has an even stronger claim. There is at present no adequate provision for these patients in hospitals, consequently the great majority must be treated at their homes. Under these conditions the advantages of the abduction treatment are decisive, since if properly applied it requires only supervision, supplemented by the quality of nursing usually at command. Conventional treatment, on the other hand, if conducted with a pretense of surgical efficiency, requires constant and skilled attention, much of which is expended on the prevention and care of bed-sores.

The apparatus required for the application of the abduction method is simple, and on occasion may be improvised. The materials for splinting are always at command. Even the qualifications of the surgeon as compared with other operative procedures of like importance are not exacting. They are a thorough apprehension of the mechanics of the method; sufficient familiarity with anatomical landmarks to assure the correction of the deformity; and the ability to apply a secure and comfortable plaster support.

Efficient treatment of the fracture usually lessens rather than increases the danger to life; repair in the old, as in the young, is primarily a question of opportunity, and the less the reparative capacity of the tissues the more essential must be favoring conditions; consequently the result in fracture of the neck of the femur is more directly influenced by the character of the treatment than is that of any other injury of its class.

The latest statistical evidence on this point is an analysis of seventy cases treated by the abduction method, the majority of the patients being over sixty years of age. Seven of these were too recent to report. One could not be traced, and there were five deaths (7 per cent). Twenty-eight of the fractures were intracapsular (central). Of these twenty-four recovered with bony union and good function (89.2 per cent). Similar results were attained in all the

cases of the extracapsular type, a total of 94.9 per cent, and although in the majority of the cases a slight limp persisted, "quite a number walked perfectly."

It will appear on the evidence presented that fracture of the neck of the femur may now be treated like other fractures and with relatively the same prospect of success.

Traction, at best inadequate, is unreliable since it is not under single control, and, as ordinarily applied and supervised, it is doubtful if it does more than to relieve the symptoms. No provision whatever is made for after-care. Thus functional disability, due to uncorrected deformity, is further aggravated by nutritive changes in and about the joint and by muscular contractions due to lack of protection.

The final results, according to common report and as determined by actual investigation, are so extraordinarily bad that they have been accepted as evidence of the futility of treatment rather than as a reflection on its quality. In fact, it is still the general impression that efficiency, as the term is understood in its relation to other fractures, even if it were technically possible, would be undesirable because, aside from the risk involved, it would be useless if the fracture were intracapsular, and would lessen the chances of repair if it were impacted at the base of the neck.

Under these conditions local treatment, if applied at all, is usually of the nature of what has been termed a surgical ritual. This point is well illustrated by an analysis of 120 cases of ununited fracture at the hip observed at the Mayo clinic, in not one of which had there been "really proper treatment" at the time of the injury.

Perhaps the most reliable statistics of cases actually treated by conventional methods are those of the British Committee of Fractures, the results being classed as good in but 23 per cent of the cases examined, showing in comparison with those of Campbell a balance of 70 per cent in favor of efficiency. The most reasonable explanation of this disparity is that direct contact combined with pressure is essential to union in central fractures, and that in

those at the base of the neck correction of deformity by apposing the fractured surfaces promotes repair and favors functional recovery, if protection is assured during the period of reconstruction.

These observations on the Abduction Treatment, which are direct quotations of Whitman's article, are further reënforced by an article in the *Boston Medical and Surgical Journal* of December 30, 1920, to the effect that the initial inadequacy of conventional treatment is further emphasized by the perfunctory manner in which it is conducted and by the disregard of after-care. For although repair is particularly slow and the neck of the femur subjected to great strain, patients are encouraged in weight-bearing within a few weeks.

A large proportion of the patients are aged and infirm, consequently the treatment of the patient rather than the injury always receives the first consideration in the textbooks. As a matter of fact, however, all patients receive the same treatment. It may vary in quantity, but the quality is the same for old and young. The standard of success is union of the fragments without regard to the range of joint motion or to the quality of the gait. Function, in the words of an authority, "is forever impaired; no matter whether the fracture has taken place within or external to the capsule, whether it has united by ligament or bone, shortening of the limb and lameness are the inevitable results."

REJUVENATION OPERATIONS.

Steinach's pronouncement (*Urologic and Cutaneous Review*, January, 1921) as to his ability to restore the vigor, activity, and endurance of youth, and incidentally a recrudescence of sexual potency, to those whose tissues have been worn to the breaking point by many years of service, has naturally attracted wide attention. Through all time such claims have been made by individuals, some of them self-deceived, others gifted with that power for influencing others which has always resulted in a train of followers and believers.

usually without much ultimate profit to themselves and often with positive hurt.

Since the sexual appetite is fundamental and when aroused stronger than all others, preservation of its powers of expression is properly ranked as of first importance. When this power is lost, even in those who do not exert it, the psychic effect is usually pronounced and the desire for its return becomes dominant; hence a promise of this makes a direct and practically universal appeal. In the history of the past there have been many such promises. At one time arsenic was widely advocated and used; damiana still has its vogue; phosphorus in its many forms has been employed, usually without harmful effect. The Chinese hunger for bird-nest soup is based, not on the delicious nature of the dish, but on the belief that it constitutes a powerful sexual stimulant. Therefore enormous prices are paid for the nests of the accepted kind. Ginseng is exported from this country to China because of a similar belief. The manufacturer of any form of appliance, if it be sufficiently extolled as a promoter of sexual activity, is assured the profits of a large sale.

Steinach has promulgated his method with an ingenuity worthy of a better cause. It is pointed out that the internal secretion of the testicle, which he attributes to the interstitial structure of this organ, dominates the sexual characteristics of the male. After the removal of the testicle in infancy or childhood male attributes, including that of potency, are abolished. By stimulating the internal secretion, male attributes including potency are enhanced.

Since the introduction into any study of experiments on guinea-pigs, white mice, dogs, rabbits, or, more convincing than all, monkeys, adds to any pronouncement that touch of higher science which gives it weight, Steinach reports a series of such experiments, mainly basing his paper upon this type of work, the rat and the guinea-pig being in the main the animals he used. He notes that if the testicles are removed from a young animal and are implanted between the muscle lay-

ers sex characteristics will be developed and also potency, but not fertility; the spermatogenic cells of these glands having entirely disappeared, whilst the interstitial cells have greatly proliferated. Moreover, he states that if this transplanted testicle be removed and planted into another castrated animal, the latter will also exhibit sex characteristics and power. More extraordinary is his statement to the effect that if an ovariectomized female animal have implanted in it a testicle, this female will manifest the evolution of the male; though there will be no change in conformation of the sexual organs.

Basing his clinical work upon these laboratory studies, Steinach claims to have devised methods by which the interstitial tissue of the testicle may be stimulated to rejuvenescence or to larger growth and greater secreting power. He believes this may be accomplished by obstructing the vas, by incisions into the testicle, or by the application of the x-ray.

Little confirmation as to clinical results is to be found in his reports of few cases, which have been duplicated thousands of times by practically every vender of proprietary preparations for the restoration of lost manhood. It will be remembered that Lydston some years ago conducted an experiment upon himself based upon the belief of the rejuvenating sex influence of the testicular secretion, implanting in his own scrotum a testicle removed from a Wassermann-negative criminal shortly after the execution of the latter.

In a function so complex and so profoundly influenced by the psychic as is that of sexual intercourse, it may be expected that results may be attained by any procedure which produces a vivid effect upon the imagination. That Steinach's contention as to the uniform or even frequent success of any of the methods he proposes is well founded is difficult to believe. If such procedures are supplemented by careful regimen and by strong mental impressions they may do even less harm than many treatments, once popular, now passed into the discard.

Progress in Therapeutics

Medical Therapeutics

The Determination of the Basal Metabolic Rate, and its Value in Diseases of the Thyroid Gland.

C. M. WILSON and D. WILSON, in the *Lancet* of November 20, 1920, state that by basal metabolism is meant the amount of oxidation taking place in the body in the postabsorptive condition — that is, after twelve hours' fast—and at complete rest. It is measured by the rate of production of carbon dioxide from the oxygen inhaled or by the heat produced. The figure, taken in proportion to the body surface area, is constant for normal people of the same sex and age. A rise in basal metabolism is one of the most characteristic manifestations of thyroid overactivity. It gives us an exact measure of the toxicity of any particular case, and if the figure is ascertained at intervals it tells whether that toxicity is increasing or is decreasing, or remains stationary. We are therefore able to follow the course of a case of Graves's disease upon a chart precisely as we watch the temperature in pneumonia.

Estimations of the basal metabolic rate are useful in the diagnosis both of hyper- and hypo-thyroidism, but it is in the treatment of these conditions that these measurements are particularly serviceable. For example, in the treatment of exophthalmic goitre, while we are dependent on rest and drugs, or on x -rays, or on surgery, on one or on more than one of these measures, the choice of remedy has been hitherto determined partly by the safety and convenience of the method, and partly by the individual predilections of the physician or surgeon. Measurements of basal metabolism bring exact methods to the process of selection. They enable us to determine which of several methods of treatment is

likely to prove effective in any one case, and to check the results of that particular method by following its effect upon a curve representing the basal metabolism taken from time to time, until it is apparent from the stationary readings that this method has brought about the full measure of alleviation of which it is capable. It is right and proper that surgical measures, with their increased risk to patients, should be held in reserve till a fair trial has been extended to rest and drugs, supplemented if need be by x -rays. In this connection it is the advice of Means and Aub, as the outcome of more than two years' work at the Massachusetts General Hospital, that if rest and drugs and x -rays fail to restore the basal metabolism to within 20 per cent of the normal, then there is a plain call for surgery, unless there is some definite contraindication such as a rising metabolic rate in spite of complete rest, when the surgeon's intervention is fraught with peril. This rule they find serviceable, and it is sound.

In their experience basal metabolic rate determinations bring out the value of rest and its limitations, define the rôle of drugs, separate the type of case that x -rays benefit from the larger group in which they are of no avail, and, with regard to surgery, lay down precise rules for our guidance. We know now when non-surgical measures have done what they can do, when the choice rests between operation and continued thyroid overactivity. We are told by this means not only under what conditions operation is necessary and beneficial, but also when the appearance of the surgeon is of evil omen. Finally, these measurements enable us to detect the malady and the relapses of that malady after treatment at a stage when active measures will rapidly restore normal function.

Their observations, as far as they have gone, confirm the more exhaustive investigations of Means and Aub. For the principle of the method and for its general application they claim no originality, but they wish without further delay to bring to the notice of clinicians in England a method that lends precision to the diagnosis and treatment of affections of the thyroid gland, and one that has, as they believe, an altogether wider significance in the clinical investigation of disease. The technique that they employ has the merit of comparative simplicity, and it may be that with its use some of the difficulties inherent in the more elaborate types of apparatus have been overcome. It is relevant to point out that the use of a bag instead of a gasometer makes it possible to measure the basal metabolic rate of patients situated far apart, and in point of fact their observations have been carried out at three hospitals not in close proximity. In the other methods the patient must come to the apparatus; with the bag the apparatus is taken to the patient. That the intricate ways of basal metabolic measurements, to which Benedict and others have given their time, have become available in a form practical to the clinician they owe in no small measure to Boothby and Sandiford. The peculiarly thorough nature of the investigations that they have carried out at the Mayo Clinic into basal metabolism invests the promised publication of their results with an unusual interest.

The basal metabolic rate is defined as the total heat production per hour per square meter of body surface, with the subject at rest, and in the postabsorptive condition—that is, after twelve hours' fast. This rate can be determined directly by measuring the actual heat produced by the subject in a given time, or indirectly by measuring the total quantity of oxygen used, together with the amount of carbon dioxide given out by the subject in the same time—that is, by measuring the end-products of the processes of metabolism. The first (direct) method has been elaborated and perfected by Benedict and Atwater in America. It is not within the scope of this paper to dis-

cuss their methods at length, since of necessity they involve a very complicated and costly apparatus only suitable for special metabolism laboratories. But from the clinical point of view the importance of their experiments lies in the fact that they determined, simultaneously with the actual heat production, the amount of oxygen used and carbon dioxide given out by their subjects, and found that when the heat production was calculated from these data it agreed, within the limits of experimental error, with the direct measurements. Their work, therefore, established the accuracy of the method of indirect calorimetry in the determination of the basal metabolic rate, and so opened up its clinical possibilities.

In estimating the basal metabolism of a patient by the indirect method four data are necessary:

1. The total volume of air expired in a given time.
2. The average composition of the expired air—that is, the percentage of oxygen used and carbon dioxide given out in a measured time.
3. The patient's weight.
4. The patient's height.

In order that the figure obtained shall be a true measure of the basal metabolism, it is necessary that the patient shall be at rest, not only during the test, but for some time before it, since any muscular activity increases the metabolic rate. Boothby and Sandiford have shown by experiment that a preliminary rest period of at least twenty minutes, and preferably half an hour, must be allowed before the experiment, and they have also shown that posture has a marked effect on the metabolic rate. As a routine, therefore, the patient upon whom the determination is to be made is kept lying on the back for at least half an hour before the test is begun. In practice, wherever possible, they have found it more satisfactory to admit the patient to the hospital for one night. On the evening previous to the test no food is allowed after a light meal about 7 P.M., and the test is performed the following morning before breakfast.

Inflammation of the Nasal Accessory Sinuses.

In the *British Medical Journal* of December 25, 1920, TILLEY states that a varying and intermittent degree of nasal obstruction and a chronic nasal or postnasal purulent or mucopurulent discharge are amongst the commonest complaints made by the patient. With these is frequently associated a unilateral supraorbital headache which is generally worse in the forenoon.

Such are some of the more general and local symptoms which inflammation in one or more of the accessory nasal sinuses may produce. They will probably appear as somewhat indefinite, diffuse, and far-reaching. He tries to focus the matter a little more closely so that those of us who are engaged in the more general practice of medicine and surgery may have a fair mental picture of an average case. Take, for instance, an adult male or female, who has a chronic empyema or abscess of, say, the right maxillary antrum. The history will be somewhat as follows:

For some weeks, months, or possibly years, he has had what he terms a "chronic nasal catarrh," especially on the right side. The discharge is yellowish, and soils many handkerchiefs with stiff, yellowish-green patches. The discharge comes on after breakfast and is often freest when he stoops down to put on his boots, and on these occasions an unpleasant smell may be noticed. If he "sniffs" hard so that the discharge passes backward into the throat, it has a "sickly" or "nutty" taste. The secretion often ceases or diminishes in the early afternoon. The right side seems more blocked than the left, and the symptom is aggravated on lying down. (This is due to the congested and irritated mucous membrane, or possibly to polypi caused by infection and inflammation of the ethmoidal cells.) He will probably tell you that he has headache over the right eye or right frontal region, and that this is also worse in the forenoon.

So that a purulent nasal discharge, nasal obstruction and headache are his chief com-

plaints, and on these alone one will be rarely wrong in suspecting a sinus suppuration. Further questioning may elicit that he is "off his feed," does not "feel really well," cannot "fix his mind on his work," or may be he has "grumbling pains" in one or more joints or limbs, or that his sight "is not so good as it was," or that he is "depressed without reason," has a feeling of a "weight on his head," his friends tell him "he has lost his color and looks seedy," and he may add that he gets attacks of "hoarseness" and "bronchial catarrh" which he cannot shake off, and so on.

All these are symptoms of a mild general toxemia or of local irritation, and should put the doctor on the *qui vive* for a possible focus of chronic infection in the accessory sinuses. How is one to diagnose the antral empyema which we have assumed to be present?

1. Tell him to blow the right nasal cavity free from all discharge. while you take note of the color and odor of the secretion which he gets rid of.

2. Ask him to sit down and place the right cheek upward facing the ceiling, and to keep in that position for at least three minutes. Then let him blow out the right nasal cavity again, and often there will be expelled an extra quantity of foul yellow discharge which had leaked from the antrum into the nasal cavity while he was in the position indicated. This is a useful test when it succeeds, and generally indicates pus in the antrum rather than in the other sinuses.

3. Now place a small 4-volt electric bulb in the patient's closed mouth, having first removed any denture he may be wearing; darken the room thoroughly, or place a black cloth over your own and the patient's head. Then notice whether the right cheek below the infraorbital margin is much darker than on the left side. If it is, then your suspicion of antral empyema will be much strengthened. To clinch the diagnosis it will be necessary to examine the nasal cavity with a bright beam of light and to wash out or to aspirate the antrum by perforating its inner wall with a suitable trocar

and cannula or curved hollow needle. This will need care and considerable practice, and hence he does not recommend its trial unless one has had and will continue to have frequent opportunities for employing the method.

When the presence of an empyema has been established the patient's time should not be wasted with nasal washes, visits to the seaside, nor with vaccines, even though the latter may be polyvalent! There is only one cure for a suppurating cavity in bone, namely, to open it freely, remove the diseased pyogenic membrane, and establish free, permanent and spontaneous drainage until the mucous membrane has returned to its normal condition. In the case of the antrum this can be done best by entering through the canine fossa, and establishing free drainage into the nasal cavity by removal of the greater part of the inner antral wall. It is one of the most successful surgical operations with which Tilley is acquainted, because the cure is rapid and complete and the after-treatment is painless and of the simplest nature.

It would be out of place here to enter into details concerning the fallacies of this or that test in the establishment of a diagnosis, or to dwell on matters of surgical technique and treatment. These are of interest only to the expert, and for this same reason he says nothing concerning the ethmoid, frontal, and sphenoidal sinuses. For although the subjective symptoms are very similar to those complained of in chronic antral inflammation, on the other hand the diagnosis and treatment demand an intimate knowledge of the complicated anatomy of the aforementioned sinuses.

In addition, the manipulations and technique necessary for examination and treatment are difficult and not without danger except when undertaken by those who have had considerable experience in this branch of surgery. Furthermore, the cost of a somewhat expensive armamentarium will be a matter of some consideration for those who will only occasionally make use of it.

Tilley adds that it may be we have come to the conclusion, from what he has said,

that it is only an obviously purulent discharge which is capable of producing local and systemic symptoms. In the main that would be a correct inference, especially if a film examination showed the presence of polynuclears, phagocytosis, and pus-producing organisms; but, as Dr. Watson-Williams has remarked, "a very copious or thick purulent discharge may be sterile, whereas a thin, opalescent or almost colorless discharge may yield a free growth of pyogenic organisms on culture."

It follows, therefore, that in all cases in which an inflamed accessory nasal sinus is under suspicion, especially from the point of view of systemic symptoms, we should submit its contents to a skilled bacteriologist who would inform us as to the nature and virulence of the secretion.

The Management of the Heart in Pneumonia.

BROOKS and CARROLL, in the *American Journal of the Medical Sciences* for December, 1920, state that care in the avoidance of circulatory strain should be carried out during convalescence. It is their custom to insist that the patient shall not sit up in bed until seven days after the temperature has remained at normal or below for twenty-four hours. He is then permitted to sit up in bed and the heart action carefully noted — irregularities, weakness of the pulse; even a sharp exaggeration of the sinus rhythm is a signal for return to the resting position. If no appreciable effect on the heart is noticed and the case progresses, at the end of another seven days the patient is allowed to sit up out of bed. Return to normal activity should not be permitted until pulse and patient have returned to former stability and vigor.

On the question of the use of digitalis in pneumonia most clinicians of experience appear to be in remarkable unanimity. Some question still exists as to when the drug should be given, the form most

desirable, dosage, and the manner of administration. It is advocated by many that it should not be employed unless signs of cardiac insufficiency appear; others believe, since digitalis is a drug from which one does not expect immediate action, even when given in its most potent form and intravenously, that its use before the specific need develops is rational. Pharmacologists appear to differ on these points, although the recent work of Canby Robinson and others indicates a digitalis effect within a few hours with oral doses of the drug. Some argue that the best effects of digitalis are gained on normal or relatively normal muscle, and that when the muscle becomes extensively degenerated the response to digitalis is less satisfactory; a belief to which Brooks and Carroll subscribe. It would seem now that most clinicians, particularly those who have had an extended experience with the treatment of pneumonia, practically agree that to get the very best digitalis effect in the disease the administration of the drug should be instituted before its need is critical.

In their opinion the best effects are obtained when the drug is given early in the disease and before the heart shows any evidence of incompetency. In so doing the adjustment to the added right-heart strains is aided, and when the full strain of the disease is thrown on the heart, the muscle of which has degenerated to a greater or less degree, the organ is better prepared to resist the tendency to dilatation.

It is their usual custom to give digitalis at the moment that the diagnosis is made or even when it is highly supposititious. This routine early preparation has worked out beneficially in their hands, and they have seen no untoward effects from this practice. Cohen's practice of the routine use of 5 minims of a good tincture by mouth three or four times a day is, in their opinion, sound and efficient therapy. They are not in the habit of giving excessively large doses except in instances in which they believe, or know beforehand, that the heart is crippled or subnormal. In such

cases they ordinarily give the drug in doses of from 15 to 20 minims every two or three hours until the rate effect appears, the pulse becomes full, the muscle sound good, and the apical thrust vigorous. If then the heart appears competent the dose is reduced to 5 minims every three hours, or perhaps entirely discontinued. If signs of inordinate right-heart strain appear or incompetency develops the dose is immediately increased. At such times quickly acting forms of the drug may be preferable, as digipuratum, given either orally or intravenously. This particular product has proved best in their experience, though in some cases digalen, digipoten, and more recently digifolin, have been used with apparently excellent results.

They have a distinct preference for the routine use of the tincture of digitalis, using always the physiologically tested tinctures. Their preference, doubtless, is for the reason that they have become more accustomed to this form of the drug and therefore perhaps use it more efficiently. They have therefore no quarrel with those who prefer the infusion, the fluid extract, the powdered leaves, or perhaps one of the newer forms of the drug. The choice and results are chiefly dependent on the familiarity of the user with his particularly familiar product.

The Toxicity of Salvarsan.

The *Lancet* of December 25, 1920, in commenting on this subject, states a form of toxic jaundice has been noted from time to time in patients under treatment with salvarsan or its substitutes, and during 1917 in certain military hospitals there occurred definite outbreaks or epidemics of this condition with a high mortality rate. The Salvarsan Committee of the Medical Research Council undertook to inquire into these regrettable accidents, and in a recent Green-book—Special Report Series, No 55—are published the results of researches designed to test the possible explanation of the salvarsan deaths. Although there was

nothing to show that the batches of salvarsan used in the fatal cases were themselves unduly poisonous, direct action of the arsenical preparations upon the tissues of the body could not be excluded. On the other hand, it had been suggested either that the salvarsan rendered the body, and especially the liver, vulnerable to microbic infection, or that the presence of an infection produced in the body an unusual intolerance to the drug.

The importance of a thorough histological investigation of tissues obtained at the autopsies on fatal cases became obvious. This was undertaken by Turnbull, and the first part of this publication consists of his report on the examination of tissues from eight cases. The number of cases is small, but the lesions found are similar, and though Turnbull is rightly cautious in analyzing his material, it is possible to arrive at provisional conclusions. The chief lesion was a severe destruction of the liver, and this was associated with advanced fatty degeneration of the kidneys, fatty degeneration of the myocardium, and slight splenitis. There was no evidence of any microbic infection, apart from post-mortem invasion, but, on the other hand, the lesions resemble closely those acknowledged as being due to exogenous poisons such as trinitrotoluene.

The second part of the report is written by Walker, who approaches the problem from a different point of view. He determined the immunization response in rabbits to known doses of killed bacteria, using as his criterion of immunity the agglutinating power of the blood serum, and observed the variation in the agglutinin response when the animals were treated with salvarsan before, during, or after immunization. He found that the administration of salvarsan does not prevent the formation of agglutinins, but rather the reverse, for it commonly induces a renewed activity in the immunity response at a time when this would normally be diminishing. It is, of course, impossible to generalize from the behavior of a single factor in the immunity response, but Walker's results are suggest-

ive. As far as they go they indicate that an infective process may be ruled out as an explanation of salvarsan deaths, and they are thus in agreement with Turnbull's conclusions. The sole factor would seem to be the toxicity of the arsenical preparation, but the whole matter is obscure and clearly demands much further research.

Blood-pressure During Intravenous Injection of Quinine.

In the *Lancet* of December 25, 1920, BRAHMACHARI, in concluding his paper, states: (1) Intravenous injection of quinine in concentrated solution (10 gr. in 20 Cc.) is generally followed by a fall in blood-pressure, and may be followed by a disappearance of the pulse for a few seconds. (2) Intravenous injection of quinine in dilute solution (10 gr. in 200 Cc.) may be followed by a fall in blood-pressure, but this fall is neither so sudden nor so great as in the case of concentrated solutions. In many cases there is no fall of blood-pressure. (3) The slower the injection is given the less is the chance of fall of blood-pressure taking place. (4) The diminished blood-pressure may persist for twelve hours or more after the injection. (5) Intravenous injection of quinine should always be given in very dilute form (1 in 300), and at the rate of 10 Cc. every minute. It should never be lightly undertaken. (6) Intravenous injection of quinine in concentrated solution may be followed by transient muscular twitchings and quickness of breathing. (7) Intravenous injection of quinine should be given after making frequent and careful blood-pressure observations during the operation. (8) As in malarial fever, especially of the pernicious type, blood-pressure is sometimes very low, and intravenous injection of quinine should be given very slowly in a dilute form, guarded by administration of pituitrin or adrenalin and application of tight bandages over the extremities.

If the above precautions are taken the dangers of intravenous injection of quinine will be reduced to a minimum.

The Potency of Polyvalent Antimeningococcus Serum.

In the *Journal of Experimental Medicine* for January, 1921, WADSWORTH states that the potency of a polyvalent antimeningococcus serum, as tested by its agglutination titer, was sacrificed by immunization with a large number of strains of the meningococcus. By immunization with a limited number of representative strains, four or six, carefully selected on account of their antigenic and agglutination properties, the potency was increased three to tenfold without sacrificing the polyvalency; that is, as tested with at least 70 heterologous strains of the meningococcus.

The agglutination titer, unfortunately, is not an entirely satisfactory criterion of therapeutic potency, but it is the only practical method available that determines also the polyvalent action of antimeningococcus serum.

Simplified Production of Antimeningococcic Serum.

AMOSS, GATES, and OLITSKY, in the *Journal of Experimental Medicine* for December, 1920, in concluding an article on this topic, state that in an attempt to simplify the manufacture of an efficacious antimeningococcus serum an experimental study has been made of a number of sera produced with a few or with single strains of meningococcus, the therapeutic polyvalent serum produced at the Rockefeller Institute with more than 50 strains being used as a standard of comparison.

It was found that horses injected with an antigen limited to five, three or even one strain yielded sera with a range of agglutinins covering in high dilution practically all the stock strains used in producing the polyvalent serum. These sera appeared to equal the polyvalent serum in range and titer of agglutinins, but on further examination fundamental differences were found. Storage for a year had little effect upon the titer and inclusiveness of the polyvalent serum, whereas the monovalent serum had fallen off greatly, especially in regard to

secondary or subsidiary agglutinins, so that only a comparatively small number of stock strains was still agglutinated. The serum made with five strains, a regular, a para, and three intermediate meningococci, approached the polyvalent serum in keeping qualities and still agglutinated at the end of this period 39 of the 41 strains tested.

Absorption tests also brought out inherent differences in the nature of the polyvalent and the monovalent sera which had appeared to be practically identical in simple agglutination tests. The homologous strain on triple absorption was able to exhaust the monovalent serum completely, but was unable to remove from the polyvalent serum agglutinins to which 30 of 44 different strains were able to react. Absorption with another single strain of the same type removed from the monovalent serum agglutinins for a majority of the test strains, but left the polyvalent serum relatively unaffected.

It is comparatively easy to produce a serum effective against about 80 per cent of the spinal strains of meningococci encountered. Deficiencies in our knowledge of the antigenic capacities of the meningococcus have led to the more or less empirical use of a large number of cultures in the preparation of a serum effective against the remaining 20 per cent of the strains. How far the number of the latter in the antigen may be reduced without restricting the efficacy of the serum remains yet to be determined. However, the experimental evidence recorded here apparently does not favor the use of an antigen limited to one or too few strains. For example, three or five selected strains produced a serum which agglutinated practically all the strains against which it was tested. But in view of the many observations which point to the greater therapeutic efficacy of a serum made with a larger number of strains we would not as yet advocate a serum prepared with too limited antigens even though it contains at first a wide range of agglutinins.

It has been brought out that a monovalent serum contains, in addition to specific agglutinins, a wide range of common

or secondary agglutinins which tend to disappear during storage. The difference between specific and secondary agglutinins is not apparent in simple agglutination tests, but is revealed by absorption tests. It is probable that in a serum prepared with a few strains the same condition exists, whereas in a serum produced with a large number of strains the agglutinins are mainly specific, as contrasted with the fact that most of them are secondary in the serum produced with few strains. The question whether secondary agglutinins are therapeutically equivalent to primary or specific agglutinins requires further study.

The Appropriate Dose of Tuberculin.

In the *Archives of Pediatrics* for November, 1920, COHEN states that in order to determine the appropriate dose of tuberculin for the individual patient, he first makes the following test for tuberculin hypersensitiveness: Intracutaneously in a patient's forearm at the same time one ten-millionth of a milligramme is injected distally, one one-millionth of a milligramme medially, and one one-hundred-thousandth of a milligramme proximally, the injections being made in a diagonal line. By this technique the same lymph channels are avoided and there is less chance of having the lymphatics carry tuberculin from the larger injections to the smaller. Twenty-four and forty-eight hours after the injections are made, their sites are examined for the presence of a papule or of induration, either of which is regarded as evidence of a reaction. If no reaction occurs, one ten-thousandth, one one-thousandth, and one one-hundredth of a milligramme are later injected similarly in the other arm, the smallest dose being distal and the largest dose proximal. If still no reaction occurs, one-tenth of a milligramme and one milligramme are then injected, and, if necessary, at a still later time 10 milligrammes.

The smallest dose that produces a distinct reaction he administers therapeutically

either by mouth or subcutaneously. The initial dose so determined has never in his hands produced an unfavorable reaction, although in some cases it has been as large as one one-hundredth of a milligramme. If this dose produces a favorable reaction, such as increase of appetite, reduction of temperature, a general feeling of improvement, etc., it is repeated every three or five days until it loses its effect, whereupon it is gradually increased until it again produces a favorable reaction. If it seems to produce no effect at all, he still repeats it for several weeks and then increases it. Should any dose produce an unfavorable reaction, such as rise of temperature, anorexia, malaise, etc., it is reduced. At intervals, tests for hypersensitiveness are again made by injecting intracutaneously in the forearm the dose the patient is taking and doses one-tenth of and ten times this amount. If no reaction occurs from any of these, he injects intracutaneously one hundred times, one thousand times, and ten thousand times the amount the patient is taking. If the amount producing the intracutaneous reaction is greater than the amount being given therapeutically, the latter is increased rapidly until it corresponds with the former. He has increased from one one-thousandth to one-tenth of a milligramme in four doses, and from one one-hundred-thousandth to one one-thousandth of a milligramme in the course of a few days, without producing any unfavorable reaction.

His usual rate of general increase is about 50 per cent, according to the following scheme: 1, 1, 5, 2, 3, 5, 7, 10, 15, 20, 30, etc. Sometimes he doubles the dose, and occasionally, when it has been found to be much below the dose producing a minimal reaction when injected intracutaneously, he increases it tenfold.

This method of administering tuberculin he has employed mostly in children. The form of tuberculin given was tuberculin Rückstand (T.R.), because in an experience with various forms of tuberculins, sera, and vaccines extending over a number of years he has obtained best results with

this form. He has not found that it makes much difference whether the tuberculin is administered by mouth or subcutaneously. Both favorable and unfavorable reactions have followed the former, and he has frequently substituted hypodermic administration for oral and *vice versa* during a course of treatment without ever producing any change in effect or reaction.

He seldom or never gives tuberculin to patients who are doing well without it. In the first place, it seems unwise to interfere in such cases, especially as the indications are that the patient is manufacturing the proper amount of antibodies and there is a possibility that an additional stimulus may disturb the balance. In the second place, he says he does not feel competent to judge the effect or the value of tuberculin in a patient who is already improving without it.

Empyema in Infants and Young Children.

SPENCE, in the *American Journal of Diseases of Children* for December, 1920, in concluding, states:

1. The mortality of empyema in infants and very young children is high with all methods of treatment employed.

2. Approximately 11 per cent of all the cases of pneumonia admitted to the Babies' Hospital of New York during the last seven years either had empyema at the time of admission or developed it during the stay in the hospital.

3. The mortality in empyema decreases very rapidly as the age of the infant advances.

4. Empyema was the sequel of pneumonia in every case of this series. When pneumonia is a complication of the common infectious diseases of childhood the mortality is very high.

5. Pneumococcus in pure culture was present in the pus from the pleural cavity in 70 per cent of these cases; the mortality for this type of infection is the lowest in the series.

6. The degree of leucocytosis is no guide to prognosis or to diagnosis.

7. In the experience of the Babies' Hospital siphon drainage has given better results in the treatment of empyema in infancy than any other method of treatment employed.

Benzyl Benzoate in Pediatric Practice.

In the *American Journal of the Medical Sciences* for January, 1921, RUHRÄH states that benzyl benzoate is a valuable addition to the armamentarium of the pediatricist. It may be used in place of atropine wherever a relaxing effect is desired on spasm of smooth muscle.

He has used it sufficiently to be able to recommend it in bronchial asthma, spasmodic bronchitis, gastric or intestinal colic, hiccough, and spasmodic constipation.

It has been recommended by others in excessive peristalsis.

In whooping-cough its action is often most beneficial, but the results are uncertain, as is the case with all other antispasmodics in this disease.

In general convulsive conditions not dependent on organic lesions of the central nervous system, especially in the new-born, the drug will be found of benefit.

It is non-toxic, but not particularly agreeable to take.

Sodium Bicarbonate Intraperitoneally.

EPSTEIN, in the *Archives of Pediatrics* for November, 1920, states that the problem that confronts the physician in cases of gastrointestinal disorders, where diarrhea and vomiting persist, resulting in rapid losses of fluid from the body, is to find a quick and efficacious method of replacing the lost fluids. Dehydration of the tissues and the consequent loss of weight constitute the most imminent dangers to the life of the child. The enormous mortality rate resulting from these maladies is caused, not by the toxins produced but by the rapid loss of fluid from the body, and

the correction of this condition is therefore of the utmost importance.

The maintenance of a constant water concentration within the body will not only relieve many symptoms that are of bad prognostic import, but also may alter the entire course of the disease, and the outcome, as far as the life of the patient is concerned. The immediate restoration of the water balance of the body will exercise its beneficial effects in the following ways:

1. By enabling the organism to better utilize its reserve energy.
2. By dilution of the possibly toxic factors existing in the body.
3. By relieving the high concentration of the blood that results from the persistent loss of fluids—*i.e.*, by increasing blood volume and blood flow.
4. By its favorable effect on the temperature curve.
5. By increasing the urinary output.
6. By increasing the general comfort of the patient.

The administration of fluids by means of the normal channel (the mouth), in the face of incessant vomiting, is difficult; to supply water per rectum by the "Murphy drip" method in the presence of a profuse diarrhea is impossible. We have therefore to search for other routes equally efficient.

A realization of the importance of a simple and successful method for the parenteral administration of fluids has led to much research work during the past few years in the effort to find easily available and efficient parenteral routes, work that has been attended with considerable success. Not only are parenteral routes being used for the purpose of restoring fluids to the tissues, but also to carry nutrition to the body as well as various medications.

The parenteral administration of fluids can be carried out in the following three ways:

1. Subcutaneously.
2. Intravenously.
3. Intraperitoneally.

The application of these methods in the gastrointestinal disorders of infancy and early childhood comprises:

(a) The administration of water in the form of normal saline solution.

(b) Nourishment in the form of glucose.

(c) Medications, as sodium bicarbonate, to overcome symptoms of acidosis.

The subcutaneous route is the route most commonly employed for the introduction of normal saline solution into the body. Its simple technique, its comparative freedom from danger, and the fact that it can be administered at frequent intervals by the attending nurse, have made it the method of choice. A glucose solution of 5-per-cent strength can be given subcutaneously in the same manner as saline. This can be given in solution with normal saline or by itself, according to the indications present. Sodium bicarbonate can be given subcutaneously in solutions of 2- to 4-per-cent strength. However, if the sodium bicarbonate solution has been sterilized by heat, there is some danger that necrosis of tissue will result, inasmuch as the process of heating transforms some of the bicarbonate into the irritant carbonate. To minimize this danger Howland and Marriott advise the bubbling of carbon dioxide through the cold sodium bicarbonate solution, to which a few drops of phenolphthalein have been added, until it becomes colorless. With proper precautions the solution may also be prepared by simply dissolving the sodium bicarbonate in sterile water, since it has been proven that sodium bicarbonate in bulk is sterile.

Results from the subcutaneous method may be disappointing, however, owing to the fact that absorption from the subcutaneous tissue is too slow to meet the emergency, especially in patients that are in a moribund condition.

The intravenous method is undoubtedly the quickest and the most efficient method of obtaining therapeutic results, since the solution is thrown directly into the circulation. In infants the longitudinal sinus is more accessible for that purpose than any other large vein because of its wide, incompressible lumen and constant position. Marfan, in 1898, was the first to administer saline by way of the longitudinal sinus.

Since then the sinus has been used for the administration of glucose and sodium bicarbonate as well as therapeutic agents, such as salvarsan, diphtheria antitoxin, and various sera. It is also used for obtaining blood for chemical and bacteriological examination and for transfusion in the hemorrhagic diseases of the new-born. The chief disadvantage of this method is that the quantity of the solution used must be limited, in order not to throw a great burden on the circulation. Also in older children where the fontanelle is closed, thus eliminating the route of the longitudinal sinus, the intravenous method is next to impossible on account of the technical difficulties of entering a vein.

The intraperitoneal method consists in the injection of fluid through a needle introduced into the peritoneal cavity. Surgeons have long recognized the power of absorption possessed by the peritoneum, and have made frequent use of it by introducing large quantities of saline into the peritoneal cavity before closing it, as a means of combating shock or serious loss of blood. However, they ventured to do so only when having the advantage of an open peritoneal cavity before them; otherwise preference was given to the subcutaneous or intravenous method.

The technique of thrusting a needle into the peritoneal cavity and the direct injection of saline solution through it was first reported by Blackfan and Maxey in 1916, who also report that this procedure has been used by Professor Garrod at St. Bartholomew's Hospital, London. No other reference to this method has been found in the literature. More accurate data regarding the absorptive power of the peritoneum are furnished by Dandy and Rowntree, of Baltimore. After injecting phenolsulphonephthalein into the peritoneal cavity in order to determine the route of absorption, they come to the following conclusions:

1. There is very rapid absorption of fluids from the normal peritoneal cavity.
2. The absorption is essentially by the blood stream and not by the lymphatics.
3. The time of appearance of the phenol-

sulphonephthalein in the blood is from two to four minutes, and in the urine four to six minutes.

4. The quantitative output in the urine is from 40 to 60 per cent in one hour.

Epidemic Acid Intoxication.

In the *Archives of Pediatrics* for November, 1920, RACHFORD states that his experience during the past winter has convinced him that bicarbonate of soda in large doses is of no value. All of the fatal cases which he saw had been given bicarbonate of soda in large doses. In some of these cases the urine became alkaline under the bicarbonate of soda treatment, but the diacetic acid and acetone in the urine persisted.

After a rather wide experience in the treatment of this syndrome, he not only became skeptical as to the value of bicarbonate of soda, but he gradually came to believe that in some of these cases it probably had a deleterious effect, and he is still of the opinion that bicarbonate of soda in large doses, given intravenously and otherwise, may help to bring about a fatal result.

Early in the epidemic he became so convinced that bicarbonate of soda was of no value that he gave up the use of it, and since then he has been firmly convinced that he has gotten better results without bicarbonate of soda than with it. He does not wish to advance the theory that small doses of bicarbonate of soda in these cases are dangerous, but it is still an open question in his mind as to whether small doses of bicarbonate of soda are of value in the treatment of this condition. He wishes simply to register his opinion, based upon clinical observations, that the generally accepted opinion that large doses of bicarbonate of soda in these cases is the all-important method of treatment is fallacious.

The line of treatment which he finally adopted, and which he believes gave him good results, is as follows: In the first place it is most important to clear the intes-

tinal canal as soon as possible. To accomplish this the colon should be thoroughly irrigated with physiological salt solution, and, as soon as the stomach can retain medication, castor oil, milk of magnesia in good-sized doses, or some other saline laxative should be given. Throughout the treatment of this condition, cathartic medication should be repeated, if necessary, to clear the intestinal canal of mucus and fermenting material.

He also believes that physiological salt solution given hypodermically or intravenously is of great value in the treatment of severe cases, especially those in which the exhaustion is great and in which fluids are not retained by the stomach.

Following the cathartic medication the Bulgarian bacillus in some form should be given, and this should be continued in fair-sized doses until the child is convalescent.

The dietetic treatment in these cases is all-important. In beginning the treatment, when the anorexia is marked and the stomach is irritable, it is important to let the stomach rest. During this period of the disease, when the stomach will not retain food, glucose or dextrose solution should be given by the rectum, and in some instances it may be necessary to give these solutions hypodermically or intravenously. But, in the great majority of cases, by the second day it will be found possible to give certain foods and medication by the mouth. Then the glucose solution may be given by the mouth, and later a teaspoonful of one of the thick malt extracts, preferably maltine, should be given every four hours, and as soon as possible, cereals, such as strained oatmeal and barley, should be added to the diet. Cane-sugar may be used in sweetening the cereals. In many of these cases, before beginning the use of cereals, Nestle's food and malted milk may be given. These foods are readily retained by the stomach and are most valuable in the treatment of this syndrome. They should be given as soon as possible and continued until the child is convalescent. As early as possible orange juice should be given in small quantities. If it is retained

it is important it should be given in larger quantities, diluted with sweetened water or mixed with gelatin, and continued throughout the course of the disease. It is important that milk, fats and albuminous foods in all forms should be omitted from the diet until the child is safely convalescent.

The dietetic treatment as above outlined must necessarily vary with the age and condition of the individual patient. Under this treatment the diacetic acid and acetone in the urine should gradually diminish until they finally disappear and the urine becomes normal.

The satisfactory way in which these cases progressed under this treatment to a final recovery may have been a coincidence, but his experience leads him to believe that if bicarbonate of soda be dispensed with or given only in very small quantities, and the above line of treatment followed, satisfactory results will be obtained.

Gastric and Duodenal Ulcers.

SCHOREGGE, in the *Journal-Lancet* for December, 1920, insists that the treatment of gastric and duodenal ulcer is a matter of good judgment. It may be either medical or surgical, or a combination of both. Medical treatment is usually considered first in uncomplicated cases. Formula feedings or the method used by Sippy seem to be the most rational medical treatment, and to give in many cases very decided benefit. The Sippy treatment consists of frequent feedings with a largely protein diet, beginning with milk and eggs, and administration of alkalis between the feedings.

However, it seems that most ulcer patients sooner or later come to surgical treatment. One can never be certain that an ulcer is healed, even though it may rest free from symptoms for a longer or shorter period. Many of his cases had been "cured," and "cured" repeatedly, by medical treatment. This fact has made us look with an open mind upon all ulcers cured medically and dietetically. He has a very

definite conviction from his observations that surgery offers far more to these patients than does any form of medical treatment. A happy combination of proper surgery with purposeful dietetic and medical supervision in the after-treatment gives the best results. The duration of the affection and the *x*-ray examination are often the guides by which surgery becomes indicated. Where there is obstruction present, or where there are repeated exacerbations of gastric symptoms or when perforation is taking place, surgical intervention is the only rational treatment. Twenty-seven per cent of his gastric cases and 5 per cent of the duodenal were perforating at the time of operation.

Another argument for radical surgery in gastric ulcer is the possibility of beginning malignancy in the ulcer. He has knowledge of four of his gastric ulcer patients who died from carcinoma of the stomach from two to four years after operation. Examination of the ulcers at the time of operation had failed to indicate anything of a malignant nature. Excision of the ulcer was done in one and simple gastroenterostomy in the other three of these four cases. All four had been under medical treatment at various intervals for several years. Earlier surgical treatment would no doubt have rescued some, if not all, of the four from the cancer death.

The choice of operation depends entirely upon the condition of the patient, the location and extent of the ulcer, and, last but not least, the ability of the surgeon. The best results are obtained with the patients who seek early relief, no matter how mild or severe the symptoms.

Deaver recommends excision of the ulcer followed by gastroenterostomy; Bal-four advises excision by cautery with gastroenterostomy, especially, when the ulcer has been the cause of hemorrhage. In only one case following a simple gastroenterostomy was it necessary to reoperate and excise the ulcer before a cure was effected. Moynihan advises gastrectomy, believing that then there is little chance, if

any, for recurrence of the ulcer and lessening of the danger of malignant change.

In his duodenal series posterior gastroenterostomy with pyloric occlusion was performed in 28 per cent of the cases and simple gastroenterostomy in 67 per cent. The immediate results were about the same so far as relief from symptoms was concerned, both giving good results. Pylorotomy with posterior gastroenterostomy gave the best results in pyloric ulcer. Practically all the cases were given immediate freedom from all gastric trouble. This operation was performed in six of the gastric lesions. Posterior gastroenterostomy with pyloric occlusion was done in 21 per cent of the gastric cases with good results, 95 per cent having immediate relief. Posterior gastroenterostomy was performed in 44 per cent, with favorable results in 83 per cent. Excision of the ulcer alone was done in 16 per cent, with only 65 per cent of immediate relief. Pyloroplasty in five cases gave unsatisfactory results. Partial gastrectomy in four cases proved satisfactory. There were four deaths in his series, one from uremia and three from pneumonia.

As to details of technique, the following points only will be mentioned: All gastroenterostomies were made with a short loop and by placing the opening in the stomach at the most dependent portion. A few interrupted linen sutures were used in all cases as a reinforcement between an inner chromic and an outer tannic catgut running suture. The linen sutures were carefully placed so as to avoid as much as possible their contact with the gastric mucosa, and to his knowledge he has not had a peptic ulcer develop. Most gastroenterostomies were closed by a sewing-machine stitch with a special needle devised by Quain, which assures absolute hemostasis and a saving of time.

A questionnaire sent to all of these patients failed to bring complete answers from more than two-thirds of the series in time for his paper. From the information

obtained he was gratified to learn that only four patients were more or less dissatisfied with their present condition. Of these, two had had acute hemorrhages some months after operation, but the associated symptoms were not those of chronic peptic ulcer.

Use of Silver Nitrate Ointment in the Treatment of Vulvovaginitis in Children.

GELLHORN, in the *Journal of the American Medical Association* of December 11, 1920, states that he employed nitrate of silver in the form of a one-per-cent ointment (silver nitrate, 1.0; lanolin and white petrolatum, of each 50.0). This ointment is injected into the vagina through an ordinary glass syringe with a slender nozzle to which a piece of soft-rubber catheter or tubing, about 3 inches long, is attached. The tubing is changed for each patient. It can be introduced without pain into the vagina of even a very small child, and is slowly pushed inward the entire length of the vagina. The latter is then very slowly filled to capacity with the silver salve. The excess of salve which oozes back through the hymenial opening is not wiped off, as it is meant to cover and protect the irritated vulva and its surroundings.

The treatment is given once a day without any additional douching. Every seventh or eighth day, after a day of rest, a smear is examined, and the injections are continued if gonococci are present. If they are absent, smears are made at intervals of three days without any further treatment until at least three have been found negative. It is then advisable to send the child home, but insist on a final examination in two weeks. Occasionally, provocative silver nitrate injections are made and smears examined subsequently.

As a result of this treatment the discharge and the other excoriations, as a rule, disappear very quickly. In some cases a scant, watery discharge persists for a short while which may harbor gonococci.

But even when there is no discharge at all it is necessary to scrape off some vaginal secretion by means of a very thin, dull spoon lest the presence of gonococci be overlooked. The average duration of treatment is from three to four weeks.

When there is a return of gonococci in the smears after a temporary absence, or when the discharge cannot be freed at any time from the microbes, one must assume that, contrary to the usual behavior of the disease in childhood, the gonococci have invaded the cervical canal. Instances of such an ascending gonorrhea with the formation of pyosalpinx or pelvic abscess are well known, though fortunately they are not frequent.

As may be inferred from the foregoing description, the treatment is exceedingly simple and absolutely painless, and it may be entrusted to mothers or nurses. In the former case, however, some supervision is advisable. It may merely be a coincidence; yet in two recurrences among his patients and in one in the practice of a friend, the mothers had carried out the treatment.

It is desirable to prescribe only small quantities of the ointment because silver nitrate is quickly decomposed and thereby becomes either inert or irritating. Discolored preparations should be discarded.

The one-per-cent silver nitrate salve has been used in his service at the City Hospital (St. Louis) on children ranging in age from nine months to twelve years. Under the older forms of treatment these children had been confined in the wards for several months; the older ones were kept out of school and exposed to all the harmful influences that emanate from the adult inmates of venereal wards in public hospitals. Moreover, the very chronicity of the affection caused the interest of internes and nurses to wane, and this still further prolonged the stay of the little patients. Happily, this condition no longer prevails. Results are obtained promptly, and the number of weeks in which the children are evacuated is less than the number of months that was formerly required.

It may be added that in adults a two-per-cent silver nitrate ointment has been found highly serviceable in the acute stage of gonorrhea. It is either injected, as in children, or introduced by means of a soft tampon. It greatly ameliorates and shortens the initial phase of the disease, during which we have heretofore been forced to inactivity, and seems to prevent the extension of the infection into the vulvovaginal glands.

Epilepsy Treated with Luminal.

In the *New York Medical Journal* of December 4, 1920, WATKINS states that his own observations with luminal cover a period of three months, February, March, and April of 1920. During this time he has administered the drug to twenty-two patients, no other medicine being used except an occasional laxative. Seven of his patients were of the idiopathic type, five were patients in whom the petit mal seizures predominated, two were status patients, and the remaining eight patients were those in whom there was an equal distribution of grand mal and petit mal seizures. The method of administration has been one and a half grains in tablet form twice daily, night and morning.

Among the first symptoms noted following its use was the constant and almost universal complaint of sleepiness and drowsiness. These later developed into various symptoms resembling those of bromism—dizziness, depression, mental apathy, confusion, memory defects, hallucinations and delusions; practically all of the bad effects of bromides were observed with the exception of the rash. At the end of two weeks the drug was reduced one-half in seven patients who showed the more marked symptoms of bromism, but the symptoms persisted, although with less severity. In two cases it was necessary to withdraw the drug entirely at the end of one month on account of the development of severe mental symptoms.

The most marked effect of the drug was noted in the decrease in the number of

convulsions. This effect was noticeable the second and third days following its administration. There was a decrease in the number of convulsions in every case with the exception of two, in which there was an increase. The seizures were greatly reduced even in the two cases in which the drug was entirely withdrawn after a month.

The number of convulsions during the three months while taking luminal was: first month 199, second month 143, third month 141—a total of 483 and an average per month of 161, or 7.31 per patient per month. For three months previous to luminal administration there was a monthly average of 532 convulsions, or 24.18 per patient per month. These figures are based on three-month periods and indicate a reduction of seventy per cent in the number of convulsions while taking the drug. The monthly average for one year previous to luminal administration was 476 as compared to 161 convulsions while taking luminal, showing a reduction in number of sixty-six per cent in all classes, which seems to be the more accurate percentage of reduction.

The lessening in the number of convulsions was most marked in the idiopathic cases, the percentage varying from twenty-two to one hundred. There was also marked reduction in the petit mal cases except in one instance, in which there was a very high increase of 330 per cent. In one other case there was an increase of 108 per cent in about an equal distribution of grand mal and petit mal seizures. In the two status cases there were no attacks of status during the three months, but the patients have an occasional grand mal convulsion.

The smaller doses seemed to have practically the same effect on the control of seizures as the larger. There was no appreciable change observed by him in the weights of the patients, little or no change in blood-pressure, temperature, or respiration. The mentality did not seem to improve under its use, as in only one case was there improvement mentally.

The manufacturers assert that under the

use of customary doses bad effects are practically absent. Dercum states that he observed at no time the slightest deleterious or untoward effects on the mental life of the patient—"nothing indeed save the cessation of the attacks." Farnell reported two cases in which there were toxic effects, both patients showing speech disturbances, slurring, scanning, and paraphasia. Ataxia was marked in both cases. In one there was tendency to drop-foot, and the knee reflexes were absent. The dose employed was from five to ten grains.

Symptoms of bromism were present in the majority of his patients, but in only two would he consider the effect toxic. One patient began to show untoward symptoms from the first, had periods of crying and confusion which later developed into delusions of persecution. Finally she threatened bodily harm to any one who came near her, and it was necessary to watch her closely. The luminal was reduced one-half without any change in her mental condition, and at the end of a month was discontinued entirely.

In the other patient there were hallucinations, both auditory and visual, later crawling on the floor, climbing the doors and windows, appeared unsteady in gait, would disrobe frequently and remain in a nude condition unless constantly watched. The drug was discontinued after a month as she became more confused. She was in this mental state eighteen days out of the thirty during its administration. After having five seizures she became more rational.

The first patient had no convulsions during luminal administration, and the second patient showed a decided decrease in the number of convulsions. He believes he would have had a higher percentage of toxic effects had the drug not been reduced in seven cases. Its effect should be watched carefully as its administration is not unattended with untoward symptoms.

Immediately following the withdrawal of luminal there was a large increase in the number of convulsions in practically every case. As is true in all drugs that have a

tendency to control convulsions, once the drug is discontinued the number of seizures rapidly increases. Seventeen of the twenty-two patients had convulsions within the first ten days, three of them being in bed for one week. The two status patients had severe attacks of status within fifteen days. There was an average of 32.64 convulsions per patient per month following its withdrawal, as compared to 24.18 previous to taking the drug and 7.31 convulsions per patient while taking luminal, showing that the epileptic habit returns seemingly with increased vigor following its withdrawal. No other withdrawal symptoms were noted, as the use of the drug appeared to be unattended by pleasant or euphoric sensations.

In concluding he says cures are not to be expected. It is at best a palliative remedy. It is not virtually a specific.

It reduces the total number of convulsions in all classes sixty-six per cent, although a small proportion of patients have an increased number of convulsions during its use. It has practically no effect upon some patients, and about ten per cent show untoward symptoms from its use.

It has all the bad effects of bromides with the exception of the rash.

The drug must be used over a long period of time and continually, as once its administration is discontinued the epileptic habit returns with increased severity.

Undoubtedly luminal serves a field in the therapeutics of epilepsy. It is worth a trial in every case, but to determine its relative value it will be necessary to use it in a great number of cases and over a long period of time.

Don'ts in Dermatological Therapeutics.

SHOLTZ, in the *Southern California Practitioner* for November, 1920, says:

1. Do not use salves in weeping eruptions. Lotions are more convenient and comfortable.

2. Do not use phenol or any other antipruritics to relieve itching in acute inflammatory dermatoses. Bland and soothing applications will do at least as well, and will not increase the irritation.

3. Do not use chrysarobin on the face and scalp as it is likely to set up a violent conjunctivitis; substitute it with the white precipitate ointment.

4. Do not use resorcin on a scalp with blond hair. It may discolor it green.

5. Do not prescribe simply "Lassar paste" when you want a coating bland base, as druggists commonly combine it with salicylic acid and sulphur; but specify "Original Lassar paste." Or, better yet, write out the whole formula: Zinci oxidi, amyli tritici, of each 15.0; vaselini, lanolini, of each 30.0.

6. Do not use vaselin as a base for protective ointments in summer, as it readily melts in warm weather from the body temperature. Use lanolin, zinc ointment, or Lassar paste.

7. Do not push sulphur or any other parasiticide in scabies until all itching is gone. Remember that itching in scabies can be kept up by a secondary dermatitis due to the overtreatment or by the scratching habit in neurotic individuals.

8. Do not be shy of water and soap in skin diseases, except in acute and subacute eczema. Even at that, remember that all varieties of eczema do not make up more than 20 per cent of all skin diseases.

9. Do not regard arsenic as a panacea in skin diseases. It is contraindicated in all varieties of eczema and has the main value in chronic dermatoses with neuropathic or nutritive background, such as psoriasis, dermatitis herpetiformis, lichen planus, etc.

10. Do not forget that the use of arsenic should not be kept up indefinitely, as it may induce generalized pigmentation and keratoses of the hands and feet with possibilities of a malignant degeneration.

11. Do not forget also that quinine is a very valuable remedy in various dermatological conditions, such as chronic urticaria, lupus erythematosus, dermatitis exfoliativa, and bullous septic eruptions. It can be used internally, or better yet, hypodermically or intravenously.

12. Do not use sulphur and tar indiscriminately one for another. They both are parasitocides and can be used in scabies and

ringworm, but otherwise they have well-defined indications. Sulphur excels in affections involving the sebaceous follicles, and is a drug of choice in seborrhea and acne. Tar is particularly efficient in promoting the absorption of chronic inflammatory infiltrates of the deeper layers of the skin, and is to be preferred in chronic eczemas, lichen planus, prurigo, etc.

13. Do not forget that while salicylic acid and resorcin in strong concentration of 5-15 per cent produce a peeling keratolytic effect, in small doses of 1-3 per cent they have the opposite keratoplastic effect and promote the growth of epithelium.

14. Do not overestimate the importance of the constitutional treatment at the expense of the local, or *vice versa*, but judge the individual case on its own merits. The best results in the majority of the cases are obtained by the combination of both.

Indications for Spinal Drainage in Certain Mental Diseases.

PIKE, in the *Journal of the American Medical Association* of December 4, 1920, states that in epilepsy, during periods of status epilepticus, furor, and stupor, general arterial and intracranial pressure are relatively increased.

In paresis there is no increase in the pressure of cerebrospinal fluid save during and shortly after apoplectiform convulsions, at which time there is increase both in intracranial and in general blood-pressure.

In cerebral arteriosclerosis, intracranial pressure is raised in proportion to that of general arterial pressure, which increase is decidedly marked in cerebral hemorrhage and thrombosis.

In manic-depressive insanity, dementia præcox, and melancholia of involution, unaccompanied by marked clouding of consciousness, delirium, or stupor, and in which there is no increase in general arterial pressure, the intracranial pressure remains normal, while in those cases in which delirium or stupor is marked intracranial pressure is greatly increased, and

this increase is out of proportion to the general arterial pressure.

It would seem rational therapeutics to reduce, if possible, increased intracranial pressure with a view to the reestablishment of the normal equilibrium between the cerebrospinal fluid and cerebral circulation. Accordingly, complete drainage of the spinal canal was carried out in each of the cases in which increased pressure was shown to exist, and the results have proved very gratifying.

Cases of status epilepticus responded promptly to this method of treatment. Following the withdrawal of the fluid, the convulsions at once became less severe and the interval longer, with complete cessation established in from twenty to forty minutes. Epileptic furor or mania showed marked benefit.

Complete drainage immediately following apoplecticform convulsions in cases of paresis was followed by a clearing up of the existing paralysis and a return to the usual mental condition within twenty-four hours. It would therefore seem that the period of unconsciousness and paralysis in these cases may have been definitely shortened, although some cases may clear up within a like period without interference of any kind.

Very encouraging have been the results of complete drainage in cases of cerebral arteriosclerosis with thrombosis and hemorrhage, when the operation has been performed within a few hours after the stroke. In all cases the patient is rendered more comfortable, general arterial pressure is lowered, and in some instances life has been prolonged for an indefinite period. *

Patients with manic-depressive insanity, in whom marked clouding of consciousness was present, together with psychomotor excitement and increased intracranial pressure, showed a response to withdrawal of the fluid by a lessened confusion and decreased excitement, and when this treatment was combined with hydrotherapy the acute period was greatly shortened.

High general arterial pressure was low-

ered in all cases following complete drainage of the spinal canal.

The method pursued in the study of these cases is one that can be followed without difficulty and which, with the observance of ordinary precautions as to asepsis, is unattended with danger. The spinal canal is regarded by many as sacred ground; and while it should not be invaded as a mere matter of routine, when withdrawal of fluid is indicated for diagnostic procedure, or when the question of increased intracranial pressure is involved, no hesitancy should be experienced in entering the canal. In more than 1000 cases in which he has performed lumbar puncture no death has occurred. Furthermore, it is a mistaken idea that only a few cubic centimeters of fluid may be removed with safety; on the contrary, results of spinal drainage are most satisfactory when the canal is completely emptied, Pike asserts.

In determining intracranial pressure, the manometer devised by Landon was used, while general arterial pressure was recorded by the Tycos sphygmomanometer. For the purpose of accurate manometric observations of cerebrospinal fluid pressure, the patient should be in a lying position with the cerebrospinal axis as nearly as possible in a position horizontal with the table or bed, placed on the side with the spine well arched by flexing the neck and thighs. The point of introduction of the needle may be easily located by placing the little finger on the crest of the ilium and allowing the hand, with fingers separated, to fall naturally on the back of the patient in a straight line between the crest and the spinal column. The thumb will almost invariably cover a point between the transverse processes of the fourth and fifth lumbar vertebræ, at which point the spinal canal may be entered without danger to the spinal cord. Local anesthesia is generally unnecessary, as the needle, if quickly passed through the skin and subcutaneous tissues, will cause virtually no discomfort, and if passed upward and toward the median line will enter the canal without difficulty, its passage through the dura being easily per-

ceived by a sensation conveyed to the hand similar to that felt in pricking an inflated bladder with a pin. With the appearance of the first drop of fluid, connection should be made with the manometer and the intracranial pressure determined. It is highly important in reading the pressure that the patient be kept perfectly quiet; movements of the body, raising the head, etc., will alter the registration. Hence in epilepsy, when the patient is resistive the operator must avail himself of a momentary period of relaxation to interpret his findings. If the intracranial pressure is normal, the mercury will record a pressure of from 6 to 8 mm., which, as shown above, may be increased markedly in pathologic conditions. If the pressure is above 10 mm. the indication is drainage, and drainage until the last drop has been withdrawn. Lesions of the posterior fossa should, of course, be handled with care; and, while complete drainage may be contraindicated in these conditions, determination of the intracranial pressure may be made with impunity, as manometric readings may be made with the loss of less than 1 Cc. of fluid.

Pike concludes:

1. There exists a direct relation between intracranial pressure and general arterial pressure.

2. Increased general arterial pressure may be markedly lowered by complete spinal drainage.

3. Increased intracranial pressure exists in many diseases of the brain and nervous system, and the intracranial pressure should be determined in all cases of delirium, stupor, or where general arterial pressure is high.

4. Status epilepticus will yield to complete spinal drainage.

5. Withdrawal of cerebrospinal fluid should not be limited to diagnosis and intraspinal medication, but should be employed in all cases, save perhaps those presenting lesions of the posterior fossa, in which intracranial pressure is increased; and in these cases drainage should be complete.

Reactions Following the Intravenous Administration of Arsphenamine in Non-syphilitic Persons.

STRICKLER, in the *Archives of Dermatology and Syphilology* for December, 1920, in summarizing his studies, states:

1. Both syphilitic and non-syphilitic patients may experience similar reactions following the intravenous injections of arsphenamine.

2. The endotoxins, produced presumably by the rapid killing of spirochetes in the blood stream of syphilitic patients, play either no rôle or a very unimportant one in the causation of reactive symptoms.

3. The percentage of reactive symptoms following intravenous injections of arsphenamine is equal in both syphilitic and non-syphilitic patients.

4. It is his impression that the two most important factors in the production of arsphenamine reactions are (1) the patient and (2) the medicament.

5. Of these two factors, the medicament is far more potent in causing reactive symptoms; the untoward phenomena may be produced either by some impurity in the arsphenamine or by some chemical reaction between the arsphenamine and the chemical constituents of the blood, or both factors may be operative at the same time.

Experimental Studies in Diabetes.

ALLEN, in the *American Journal of the Medical Sciences* for December, 1920, in concluding a paper which has some practical bearing, states that dogs show an increased tendency to glycosuria from glucose given by stomach or subcutaneously when as little as a fourth or a third of the pancreas is removed. Apparently, therefore, the pancreas has little if any "margin of safety" from the standpoint of strictly normal metabolism, and there may be frequent occasions when its full endocrine function is needed for the purpose of fully normal assimilation. Quantities of sugar which exceed the normal assimilation may possibly be conceived as overtaxing the normal pancreatic function.

The internal secretory potency of different parts of the pancreas is equal, as far as such tests can determine; but the influence of a given mass of tissues increases as the total mass of remaining tissue decreases. The "margin of safety" of the pancreas with regard to diabetes is large, amounting in the dog to at least seven-eighths of the gland. The point at which diabetes begins is sharp and definite, according to three criteria: (a) An animal may be brought so close to the verge of diabetes that it is brought on by the removal of as little as 0.1 gm. additional tissue. (b) At this point a new histologic phenomenon begins, namely, the hydropic degeneration of the islands described elsewhere, which is the basis of the characteristic aggravation of diabetes on excessive diets, while such excesses are harmless in any state of lowered tolerance short of diabetes. (c) The lowering of tolerance in any stage short of diabetes is only apparent, representing but a slight delay of assimilation while the actual capacity is unlimited, and the maintenance of continuous glycosuria through any long period of weeks or months is absolutely impossible by any quantity of sugar or any other food; but in diabetes the limit of assimilation is real, and glycosuria progressively increases to the point of total excretion of the quantity administered. The curve of lowering of tolerance, with removal of successive portions of pancreas, is therefore approximately hyperbolic in form. Starting as a variable which descends by successive slight degrees below the level of normal tolerance, it turns at the vertex into a variable which approaches total diabetes as its limit.

Certain conceptions concerning the quantitative relations of the pancreatic hormone may be deduced as follows: It stands in some quantitative relation with the amount of carbohydrate metabolized, because a deficiency is revealed by moderate glucose dosage when only one-fourth of the pancreas is removed, and because of the above-mentioned proof that in diabetes the islands can be driven to destructive overfunction by carbohydrate excess and spared by regu-

lation of diet. A more important quantitative relation is the minimum requirement of the body cells to prevent diabetes. When this minimum quantity of the hormone is present the organism retains its power to metabolize almost the whole of any glucose dosage that can be absorbed from the stomach or subcutaneous tissue, no matter how large or how long continued. When this minimum is reduced by only a trifle the phenomena of diabetes begin. With mild diabetes this deficit may be guarded against by restriction of carbohydrate. With more severe diabetes the total diet and body weight must be reduced. With still more severe diabetes the supply of hormone is inadequate for even the lowest metabolism, and glycosuria is therefore uncontrollable even by fasting. As an example it may be assumed that a dog becomes diabetic with removal of between seven-eighths and nine-tenths of the pancreas, and in this condition requires maximal starch and sugar feeding to maintain glycosuria. Hopeless diabetes, uncontrollable by fasting, results (barring hypertrophy) when the remnant is about one-twentieth of the pancreas. The absolute difference between these fractions may be, for a fair-sized dog, perhaps two grammes of pancreas tissue. Accordingly the difference between the demands of the highest possible carbohydrate metabolism and the demands of the lowest possible general metabolism amounts in such an animal to no more than the possible output of 2 grammes of pancreatic tissue, only a small fraction of which consists of islands.

Such a calculation is of interest in animals when quantitative estimations can be made with approximate accuracy by operations. There is evidently a fallacy in the application to human patients, for it is impossible that the destruction of islands in human diabetes should always fall within the narrow limits mentioned. As a matter of fact, diabetes uncontrollable by fasting is very common in experimental animals and very rare in human cases. A possible explanation may be that one prominent feature of human cases is a functional defect which interferes with the internal

secretory activity of the islands and at the same time renders them specially susceptible to damage from functional overstimulation. Such an explanation is supported by observations in other directions. One of these is the abundance of normal appearing islands in some clinical cases necessitating the assumption of a functional impairment. Another is the wide variation in the susceptibility of different human patients (especially the old and young) to degeneration of islands and corresponding decline of tolerance from dietary excess. At the same time it seems evident that a relatively small mass of normal island tissue can prevent diabetes, and the conclusion is, therefore, suggested that any positive means of augmenting the endocrine pancreatic function even by a little would give therapeutic results far surpassing those of the negative plan of sparing the function by diet.

The Treatment of Anthrax with Normal Ox Serum.

The *British Medical Journal* of December 4, 1920, in an editorial on this subject, states that in an interesting monograph recently issued from the National Institute of Hygiene of the Argentine Republic, Penna, Cuenca, and Kraus describe the steps that led to the employment of normal ox serum in the treatment of anthrax in the human subject and the remarkable results obtained. The large quantity of serum from an immunized animal that is needed in the treatment of anthrax served to draw attention to the need of a better method, and the absence of demonstrable antibodies in this therapeutic serum led to an investigation of the value of serum from normal animals for protecting against anthrax.

In the first part of the monograph is described in detail the experimental evidence which led to the conclusion that serum of a normal ox compares favorably with that of the immunized animal for protecting a rabbit of 600 to 800 grammes against a lethal dose of living anthrax

bacilli. This protective property also obtains in the case of serum of the normal horse, mule, and sheep. The protective power of normal ox serum varies in different animals; but as the authors could always find some specimens of normal ox serum as strong in protective power as the serum of the immunized animal, they proceeded to apply carefully tested normal ox serum for the treatment of anthrax in the human subject. Before use the normal ox serum was heated twice for half an hour to 56° C. for the purpose of eliminating any toxicity it might possess. Ox serum so heated did not produce in man any bad reaction, even when injected intravenously. The usual dose given was 30 to 50 Cc., which in bad cases is injected intravenously, but in milder cases may be given subcutaneously or intramuscularly. In some mild cases it may not be necessary to give as much. The dose is repeated in from twenty-four to forty-eight hours if necessary. In applying this new treatment to human cases of anthrax they began with great caution, and first of all treated moderately severe cases with the serum of an immunized ox. This proving successful, they next tried serum of the normal ox, and found it to succeed equally well. Having thus obtained confirmation of the protective value of normal ox serum for treating the disease in the human subject, they proceeded to apply the method on a wide scale.

After injection of the normal ox serum, whatever the route employed, the reaction of Sclavo is observed. This consists of a rise of temperature, which returns to normal in twenty-four to forty-eight hours, and at the same time the inflammation and edema at the site of the malignant pustule diminishes. In some cases the local edema persists or the temperature remains up until another injection of the normal ox serum is given.

Full particulars are stated of the clinical features of 200 cases of anthrax treated at the Muniz Hospital with normal ox serum. In all of the cases the anthrax bacillus was demonstrated in the local lesion by film

preparations, and in the majority it was obtained by culture as well. In sixteen of these cases a positive blood culture was obtained. The situation of the malignant pustule in these 200 cases was as follows: Face and head 73, neck 56, thorax 11, arms 29, hand 25, leg 4, abdomen 2. In addition to these 200, 180 further cases of anthrax have been treated with normal ox serum, making in all 380. The mortality was 6.2 per cent. Sixteen of the cases treated were instances of intestinal anthrax, which are always fatal, and these the serum failed to cure. It is noteworthy that six of the cases of anthrax septicemia recovered on treatment with the normal ox serum. The authors are puzzled to account for the fact that all the intestinal anthrax cases died as usual, while some of the septicemic cases recovered with the serum treatment; they incline to the view that the intestinal cases are metastatic in origin and only occur in the worst form of infection. In addition to the cases referred to, 418 cases of anthrax were treated in five other hospitals with normal ox serum, with a mortality of 4.3 per cent.

The exact appraisalment of these results is difficult, owing to the extent to which anthrax mortality fluctuates. Thus between 1905 and 1914 the mortality in the Muniz Hospital varied between a minimum of 2.7 and a maximum of 25.0 per cent. Sclavo treated 164 cases with his well-known immune serum, with a mortality of 6.09 per cent. That the normal ox serum has remarkable protective properties against anthrax, both experimentally and therapeutically, seems evident, and the treatment is being tried in the Argentine on a wide scale with encouraging results. The extraordinary thing is that the protective power of serum from normal animals, such as the ox, against anthrax should not have been discovered before. The mode of action of the serum is at present obscure, but light on this matter will doubtless be forthcoming before long with the problem in the hands of such a distinguished pioneer in serology as Kraus.

Treatment for Colic in Breast-fed Infants.

GRULEE, in the *Journal of the American Medical Association*, Dec. 18, 1920, says that preliminary to any statement concerning the treatment of colic, one must always bear in mind that, in the majority of cases, colic is a condition due not only to too much fat but usually to too great a quantity of breast milk. One can reduce the quantity of breast milk, of course, by shortening the length of the nursing period. This disproportionately reduces the quantity of fat in the food since, toward the end of the nursing period, the fat is several times as great relatively as in the early portion; but it is well known that many cases of colic do not respond to these simple methods, and one is frequently at one's wit's end to devise other ways of combating the difficulty. A treatment which has been repeatedly tried out and which has proved successful, not only in his own practice but in that of his colleagues, is as follows:

Morning and evening these children are given about 5 Cc. of the liquid culture of active lactic acid bacilli, and each breast feeding is preceded with a gramme of powdered casein. There is, of course, no difficulty in administering the liquid culture of the lactic acid bacilli; but powdered casein is hard to use. In the first place it is quite difficult to get pure casein on the market. There are proprietary combinations of casein which can be used, and it is possible to obtain pure casein if sufficient search is made. The ordinary casein of commerce is, however, not to be used.

Even though the powdered casein is obtained, it is not at all soluble by ordinary means, and hence it is necessary to make a paste and place this on the back of the infant's tongue. If it is impossible to obtain the powdered casein, one may carefully skim milk and take the curd of the milk. The quantity of curd to be used before each nursing is approximately that obtained from an ounce of skimmed milk.

One advantage of this treatment is that ready coöperation of the mother is usually obtained when she learns that the treat-

ment consists in giving the child some extra food. One should not expect that treatment of this sort will bring results at once; but it is not usual for a case of colic to resist this treatment for longer than a week or ten days, and usually the benefit begins to appear within twenty-four to forty-eight hours.

Another type of colic which is rather frequently encountered is that due to a deficient quantity of breast milk. If the infant has colic under these circumstances, the best food for supplementing it will undoubtedly prove to be albumin milk.

The Role of Heart Massage in Surgery with Reference to Case Resuscitated by a New Technique.

BOST, in the *Charlotte Medical Journal* for December, 1920, states that his own method is to extend the abdominal incision well up to the ensiform cartilage; the left costal cartilages are well retracted, bringing the anterior diaphragmatic insertion well into view. A two-inch incision beginning one inch to the left of the median line, carried outward behind the costal margin, cuts the fibers of the diaphragm near their insertion. The opening is rapidly dilated with two or three fingers of the right hand, so that the whole hand can be passed into the thoracic cavity, and the base of the heart effectively massaged. No vessels are injured in this incision, as the superior epigastric artery is to the inner side and the musculophrenic branch enters the diaphragm deeper than the incision. The liver and stomach, even if prominent, offer no obstruction to this route; nor is the pericardium in risk of being opened. During the massage the parts fit snugly around the wrist of the operator so that air is not sucked in, and there is no tendency to collapse of the lung. The incision is easily closed and made air-tight.

In concluding his paper he says:

Heart massage is an established method of resuscitation, which, properly employed, will serve as a final trump card for reviving many who would perish without its use.

The case he cites illustrates its unique value—after twenty-five minutes of asystole.

When the heart has once stopped for a definite appreciable time, it is very doubtful whether artificial respiration has any influence upon it.

The possibility of resuscitation bears a definite relation to the time that elapses between the cessation of the heart-beat and the massage, and the shorter the interval the more certain is the response.

The length of the interval, during which the ordinary methods of resuscitation are employed, should probably vary with individual cases, but it should rarely be done under three or four minutes (unless the abdomen be already open), though a much longer interval need not bar the operation.

Subdiaphragmatic massage may suffice, especially in children and if promptly undertaken, but if only the apex is reached and the heart remains unresponsive after two or three minutes, it should be dispensed with in favor of the transdiaphragmatic method.

No surgeon, even if relatively unskilled, should be content to abandon a case without giving his patient the benefit of direct cardiac massage.

This new technique offers a simpler method of approach and is believed to be a decided improvement upon all other methods of doing direct heart massage, as it enables the operator to grasp the heart firmly, involves less risk of hemorrhage, trauma, lung collapse, and shock, and the incision can be more quickly satisfactorily closed.

The Diagnosis and Treatment of Some Diseases of the Endocrine Glands.

In the *British Medical Journal* of November 27, 1920, MURRAY states that as soon as a condition of hyperthyroidism or toxic goitre is recognized treatment must be undertaken, as these early cases are much more amenable to treatment than those in which the fully developed Graves's disease is present. Rest in bed for a few weeks is advisable, after which twelve to

sixteen hours a day should suffice. A liberal diet consisting of milk, fats, and carbohydrates should be regulated according to the necessities of each case. Red meats and meat extracts should be avoided, as they tend to stimulate thyroidal secretion. In these early cases treatment by radium or x -rays is of considerable value. As a rule x -rays have been used in his cases, when they can be conveniently applied at short intervals, and radium when long intervals between the applications are desirable on account of the distance to be traveled from home. In the use of x -rays as large a dose is given as can be tolerated without injury to the skin. Barclay, who has treated many of Murray's cases, employs from one to one and a half Sabouraud units measured before filtration, and then passed through 3 mm. of aluminum and a layer of boiler felt on the skin. This dose is repeated twice a week for the first few weeks, after that once a week, and later on at lengthening intervals according to the requirements of the case.

The radium treatment has been carried out at the Manchester Radium Institute by the application of plates, of a strength of 2.5 milligrammes or millicuries to the square centimeter, over the enlarged gland. The plates were of such size that 45 to 76.5 milligrammes were applied each time, screened by 1.5 millimeters of lead. The plates were applied for twenty-four hours about once every six weeks. In early cases radiotherapeutic treatment for three to six months may suffice, whereas in fully developed cases it may be necessary to continue it for one or even two years in order to obtain its full effects.

If these methods of treatment are not available the daily application of a mild faradic current by electrodes applied over the goitre and at the back of the neck for an hour twice a day may be used instead. Many drugs have been employed, but arsenic given in small doses for several months at a stretch has given the best results. No consistently good results have been observed after the use of organic ex-

tracts, with perhaps the exception of suprarenal gland. With the exception of fresh milk from a thyroidless goat, the various preparations made from animals after thyroidectomy have not fulfilled their promise. The various crises and complications which occur in Graves's disease require treatment which is largely symptomatic.

The recognition of the early signs of thyroidal deficiency in infants and young children is of vital importance, as delay in the commencement of treatment may cause such arrest of development as can never be fully made good. One of the earliest signs of cretinism is a delay or arrest of normal growth, and this should at once lead to a careful search for other signs of the malady. Lack of the normal activity may be noted by the mother, along with a tendency to coldness of the extremities and dryness of the skin. At this early stage the child will not have the appearance of a typical cretin, but slight thickening of the subcutaneous tissues, especially of the face, neck, supraclavicular fossæ, and backs of the hands, may be discernible. The bridge of the nose may be slightly depressed and the complexion is pale. On examination of the neck the thyroid gland will be found to be too small, or absent.

The maladies which may be mistaken for cretinism are mongolism, achondroplasia, and rickets. When there is difficulty in making a diagnosis it is advisable to treat the patient as a cretin. If decided improvement soon takes place the diagnosis of cretinism is clear. In an early case a small dose of one of the thyroid preparations should be given each night. In a child under one year it is advisable to begin with a dose of 1 minim of liquor thyroidei or half a grain of dry thyroid powder and gradually increase it up to double or treble this amount during the first three weeks of treatment. Subsequent doses must be regulated according to the effect produced. In older children larger doses may be given from the beginning. In any case gradually increasing doses will be required as the child grows older so as to supply suffi-

cient hormones to maintain the basal metabolic rate at the level necessary for full development to take place.

In the adult, symptoms of thyroidal insufficiency are apt to appear between the ages of forty and fifty, and less frequently earlier or later than this period. As they are much more frequent in women than in men they are apt to be attributed to the changes in the ovary which occur at this time of life. As the thyroidal hormones diminish the basal metabolic rate falls and the patient complains of gradually increasing loss of energy. Greater voluntary effort is required to initiate any action and more time is taken up in its execution. This is shown in a slowness in response to questions, which are, however, answered correctly. Some patients, though conscious of their difficulties, continue for a time their usual occupations, others soon begin to limit their sphere of action and tend more and more to lead a sedentary existence. The memory may become defective, especially for new names and recent events. Sensitiveness to cold and ill-defined visual and auditory sensations or even hallucinations may be present. The temperature may be slightly subnormal. Slight myxedematous swelling of the subcutaneous tissues can usually be detected. At first the slight fulness of the face, combined with the pink flush in the cheek, may give a false impression of good health to the patient's friends. Careful inspection of the eyelids, of the supraclavicular fossæ, and of the backs of the hands will generally show the true nature of the swelling. The skin becomes drier and perspiration occurs less frequently than before. A fine powdery desquamation occurs especially on the legs, and the hair becomes thinner on the head. The thyroid gland will be found to be diminished in size, though it is not as yet shrunk as in fully developed myxedema.

It is much easier to supplement a deficient thyroid gland than it is to control one which is overactive, so that the treatment of these cases presents no difficulty once

their true nature is recognized. Two or three grains of dry thyroid or five minims of liquid thyroid extract given each night will usually remove the symptoms in the course of a few weeks, though in some cases larger doses may be necessary. The daily dose must, of course, be continued for the rest of the patient's life, and it may have to be increased as time goes on, owing to the progressive atrophy of the gland and further diminution in its secretion of hormones. In time this may fail altogether, so that the patient is entirely dependent on external sources for an adequate supply of thyroidal hormones to maintain the basal metabolism at the normal rate.

Advanced cases of myxedema in which the symptoms have been present for years without suitable treatment unfortunately still occur, as he has seen two recently; both of them rapidly recovered when treated with preparations of the thyroid gland. In such cases the dose should be soon increased up to 10 minims of the liquid extract once a day, which usually suffices to keep the patient free from symptoms of the malady as long as it is continued. As an illustration of the long period for which health can be maintained by this means, it may be mentioned that the first case of myxedema treated by thyroid extract, whose life history he recently recorded, lived in good health for over twenty-eight years, and only died last year from cardiac failure at the age of seventy-four.

When the secretion of the anterior lobe fails early in life growth is arrested, the bones are not fully developed, the external genital organs remain undeveloped, the secondary sexual characters do not appear at puberty, and the skin is soft and smooth.

In consequence of failure of the posterior lobe sugar tolerance is raised and the subcutaneous fat is largely increased. In the adult this development of obesity is a striking feature. The fat chiefly accumulates in the supraclavicular fossæ, in the lower part of the front and sides of the abdomen, at the back of the arms, over the hips, and upper part of the thighs. The

face, hands, arms, legs, and feet usually are little if at all affected. The distribution of fat thus resembles that seen in adipositas dolorosa, but it is painless. The sugar tolerance is increased, so that in some cases as much as 400 grains of glucose, if the stomach will retain it, may be taken without producing any glycosuria. The temperature tends to be subnormal and the pulse to be slow and of low tension. The metabolic rate was frequently found by Plummer to be as much as 25 per cent below normal. The sexual power is diminished and there may be impotence in the male and sterility in the female, with atrophic changes in the external genital organs. The skin is soft, cool, and smooth. Polyuria occurs in some cases, and so diabetes insipidus has been attributed to a deficiency of the posterior lobe, but recent investigations by Houssay and Leschke indicate that this malady is due to a lesion of the tuber cinereum rather than of the hypophysis itself. It is, however, to be remembered that the hypodermic injection of 1 Cc. pituitrin every day or two often controls the polyuria for the time being, as a single dose has reduced the amount of urine passed in twenty-four hours from 13,000 to 1800 Cc. the next day.

It was naturally hoped that pituitary extract would be able to supply the missing hormones and remove the symptoms in these cases just as thyroid extract does so promptly in myxedema. Some improvement does follow the administration of two or three grains of the whole dried gland several times a day. Cushing has found 12 grains three times a day necessary in one case to produce an improvement. The results have so far been disappointing, and clearly indicate that we are still unable either by oral or subcutaneous administration of pituitary extract to make good the loss of the special hormones secreted by this gland. Apart from these cases pituitrin has proved to be of service in raising blood-pressure in cases of shock or heart failure and in stimulating peristalsis in inertia of the bowel. In obstetric practice,

also, as a uterine stimulant it is a powerful though sometimes dangerous therapeutic agent. It may be given subcutaneously in doses of 10 to 30 minims, or in the treatment of shock it may be added to an intravenous saline injection.

The Value and Significance of Blood-pressure in Obstetrics.

SCHULZE, in *Minnesota Medicine* for December, 1920, in summarizing his article on this subject, states:

1. A series of blood-pressure readings properly taken, rather than a series of urine analyses, serve as an index of the eclamptic or the non-eclamptic condition of the patient.

2. The normal range of blood-pressure during pregnancy has been found to be between 100 and 130 mm. Hg, with 114 to 118 as an average.

3. As a matter of instruction it may be advised that if the blood-pressure is below 100 be prepared for shock; if above 150 it is no longer to be regarded as normal.

4. A moderately high blood-pressure that shows no tendency to mount and which is not accompanied by symptoms of eclampsia is not necessarily serious; a pressure, even if low and unaccompanied by symptoms of eclampsia, but which does show a tendency to mount, should be regarded with suspicion.

5. A gradual rise in blood-pressure takes place throughout pregnancy, not simply in the last months of pregnancy and during labor. After delivery a return to the low level takes place.

Scleroderma as a Possible Manifestation of Chronic Arsenic Poisoning.

AYRES, in the *Archives of Dermatology and Syphilology* for December, 1920, in summarizing his paper on this subject states:

1. Three consecutive patients with diffuse scleroderma at the Massachusetts General Hospital showed arsenic in the urine, and two of them gave a history of exposure to arsenic. One patient with morphea fron-

talis had been exposed to arsenic and showed arsenic in the urine.

2. The possibility of scleroderma being a manifestation of chronic arsenic poisoning cannot be affirmed from the evidence at hand.

3. Careful histories as to the possible exposure to arsenic, a detailed record of general symptomatology and arsenic tests of the urine of a large series of cases of scleroderma would tend to determine whether arsenic plays a rôle in the etiology of scleroderma.

4. Arsenic has been found in traces in 43 per cent of a series of forty-eight specimens of urine selected at random. It would have to be present in a much higher percentage in urine from sclerodermatous patients to be of any significance.

5. Scleroderma and chronic arsenic poisoning possess many symptoms in common in individual cases, such as neuritic manifestations, pigmentation, cutaneous alterations of various kinds, loss of weight with muscular weakness, intermittent irregular fever, gastrointestinal disturbances, vasomotor instability, rapid and irregular heart, menstrual disturbances, etc. On the other hand, many of these symptoms may be lacking in cases of well-advanced scleroderma.

Simplified Infant Feeding.

In the *New York Medical Journal* of December 18, 1920, RICHARDSON asserts that infant feeding, as taught until recently in the schools, urgently needs simplification.

The first step in simplification, and the most important for the welfare of the race in the future, is the maintenance of breast feeding, partial or complete, in the majority of babies. Such a statement alone is inadequate. Proof of the assertion, as well as help to the mother in accomplishing it, is needed. This consists in the adjustment, as he likes to call it, of the breast to the baby, or the baby to the breast. He has attempted to show how any man may keep that wonderful ally, Nature, on his side, and in many cases take all the credit while he allows her to do most or all of the work.

To do this requires a reasonable familiarity with some reasonably simple form of infant feeding procedure for use in connection with the breast feeding, at some time during the period of lactation. He has tried to formulate the simplest that he has yet found.

A useful servant, but one that must be watched lest it assume the mastership, is some form of dry milk.

The successful care of any goodly proportion of premature babies presupposes the employment of breast milk in all cases.

Breast milk is not the rare thing we like to consider it—we can get it for the premature infant, if we go after it.

Weaning is a gradual affair—as such it may be accomplished without disagreeable effect upon either mother or child, if it is begun early enough.

Indications for Lumbar Puncture.

SOLOMON, in the *Boston Medical and Surgical Journal* of December 30, 1920, states from the point of view of the neuropsychiatrist, certain rules may be promulgated as to the use of lumbar puncture. These which follow are somewhat similar to those given by Ravaut:

1. Cases of early syphilis showing symptoms indicative of central nervous system involvement, namely, headaches, dizziness, ocular and aural symptoms, should have a lumbar puncture.

2. All cases seen after the early secondary stage that are not to receive most intensive treatment.

3. All cases treated from the primary or early secondary stage which do not give a negative Wassermann reaction in the expected time.

4. All cases showing mental or nervous symptoms, irrespective of the blood Wassermann reaction. This is based upon the fact that many cases of tabes, cerebrospinal syphilis, gumma, and even paresis give negative blood Wassermanns.

Again, it may be pointed out that:

1. The central nervous system is involved by syphilis very frequently in the

primary and secondary stages; that this involvement is ordinarily benign and disappears symptomatically with or without treatment.

2. In a small number of cases, acute meningitis, meningoencephalitis, vascularitis, and gummas occur in the secondary period of the disease.

3. About 10 per cent of all cases of syphilis develop late neurosyphilis, tabes, paresis, meningitis, meningoencephalitis, gummas, vascularitis.

4. Neurosyphilis is always serious, affecting the mind, utility, and life of the patient.

5. Diagnosis is often only possible by the aid of the spinal examination.

6. Therapeutic results are better, the earlier the diagnosis of syphilis is made, and the sooner treatment is instituted.

7. The spinal fluid is often positive long before definite symptoms are present; hence the need of frequent lumbar punctures.

8. More intensive treatment is usually required to treat neurosyphilis than in the treatment of non-nervous-system syphilis.

9. Cases of meningitis, acute meningoencephalitis, and mild vascular syphilis usually react favorably to intensive intravenous injections.

10. For these conditions intraspinal injections will at times accomplish more than intravenous therapy.

11. Tabes is more difficult to improve than the above mentioned forms. Many cases, especially the early ones, show improvement under intravenous therapy adequately administered, but with intraspinal therapy will frequently do much better. It is often the method *par excellence*.

12. Many cases diagnosed as paresis make fair recoveries under intravenous therapy.

13. Intraspinal injections and drainage of the cerebrospinal fluid may aid in the intravenous treatment of general paresis.

14. Intraventricular injections may at times give more favorable results than any other in the treatment of paresis.

Postanesthetic Mutism.

The *Lancet* of December 11, 1920, writing editorially on this subject, says that an interesting case of loss of speech after an anesthetic directs attention to other mental effects which are occasionally observed after the taking of these drugs. With rare exceptions these are much more often functional in all probability than due to any organic lesions. Cerebral hemorrhage or thrombosis resulting in definite hemiplegia has certainly occurred more than once during the inhalation of and the recovery from anesthetics, but such an event is rarer than the appearance of emotional or mental alterations, which also may last for some time. It is difficult to ascribe these to organic lesions. It happens not very infrequently, that following an anesthesia, and starting soon after recovery or sometimes days later, a patient's mental condition becomes abnormal. There may be actual mania or there may be melancholic symptoms. An attack of this kind is rare unless the patient has been previously affected in the same way. Attacks of a hysterical nature soon after recovering consciousness are not at all infrequent among emotional persons. In these there may be great excitement. Delirium lasting for some days has been known to follow anesthesia. There may also be speech defects, and loss of speech certainly functional in character has occurred after a short inhalation of nitrous oxide, without, however, persisting long.

It is noticeable that the patient under discussion was apparently the kind of subject in whom congestion of the vessels of the head is particularly apt to occur during narcosis, and that he was inhaling anesthetics for a long space of time, over two hours. It appears that, whether there was a structural lesion or not to account for the motor aphasia, there was certainly present also an emotional condition of the mind not very infrequent after anesthesia in neurotic people. The mental, or as Dudley Buxton calls them, "quasi-mental," phenomena which occur during and after narcosis provide an interesting and a little-trodden field for investigation. It is probable that wide

study would reveal a number of curious mental after-effects, of longer or shorter duration, in persons who have been through anesthesia—effects which, up to the present, have been little noticed and are quite unexplained.

Some Observations on the Blood-sugar in Diabetes.

In the *Quarterly Journal of Medicine* for October, 1920, PICKERING in his conclusions states:

1. The blood-sugar is almost invariably raised in diabetes.

2. It tends to increase with the duration of the disease.

3. It varies directly with the clinical severity, but in mild cases with albuminuria or a history of heavy consumption of alcohol or tobacco it is often high.

4. It is reduced by fasting.

5. Judging by the carbohydrate tolerance the reaction of the blood-sugar to dietetic treatment is of more importance than its height. That is to say, a case with high blood-sugar which is reduced by restriction of carbohydrate will probably show greater carbohydrate tolerance, and therefore will probably do better, than a case with lower blood-sugar which is not affected by diet.

6. A blood-sugar persistently above normal in spite of treatment is not invariably a bad sign, for the blood-sugar does not always fall to normal when the urine is kept sugar-free for a long time. At the same time, of course, it will be advisable to be cautious in increasing the carbohydrate in such cases, and in giving a prognosis.

7. If the course of the blood-sugar be compared with that of the carbohydrate in the food and with that of the glycosuria, it will be found to correspond more closely with the former in mild cases and with the latter in severe.

8. The amount of carbohydrate in a meal taken from one and a quarter to two hours beforehand appeared to have no effect on the blood-sugar. Apart from fasting or

very low diet the amount of food, other than carbohydrate taken on the previous day, frequently had little or no effect on the blood-sugar.

9. A high renal threshold does not appear to be an unfavorable sign.

10. There is no striking relation in the above cases between the renal threshold and the age of the patient, though, apart from two of his cases under twenty, there was a rather greater proportion of low thresholds among the older cases.

11. There was no relation in his cases between the renal threshold and the duration of the case.

12. The severe and slight cases show greater tendency to steadiness of the renal threshold than the intermediate ("mild") ones.

13. More research on the renal threshold would be necessary before much reliance could be placed upon it in deciding points of treatment or prognosis.

14. A study of the blood-sugar, particularly of its variation under treatment, is of great value in forming an opinion of the nature and probable course of a case.

Cutaneous Anthrax.

In the *New York Medical Journal* of December 11, 1920, GRAHAM states a few good men scoff at the idea that the treatment of anthrax is of any avail, and we now and then see a patient act in such a way as to make us think their opinion may be correct. However, after following up a considerable number of cases and after talking the matter over with physicians skilled in the handling of the disease, he feels that it is hard to deny that treatment is efficacious in the face of the increasingly satisfactory results which follow the method more in vogue in New York.

Up until very recent years, there appeared to be no uniform opinion as to the proper method of attacking the lesion. It was cauterized, excised, incised, poulticed with various supposedly curative applications, or left alone. One mode of pro-

cedure seemed about as potent as another, and the mortality was rather appalling. Some time in 1916 Graham first heard of the use in the treatment of human anthrax of the serum prepared by the U. S. Agricultural Department and known as Eichhorn's serum. The method then followed was to combine as wide an excision of the lesion as was practicable with the intramuscular or intravenous injection of the serum at certain intervals. This was undoubtedly a step forward, and was signalized by an improvement in the mortality records. However, there was certainly a question about the propriety of making an extensive fresh incision in this dangerously infected area, and the method was inadequate, too, in that it offered no relief in those cases, frequently seen, in which the inflammatory infiltration of the tissues was so wide-spread as to make an operation out of the question.

About two years ago Regan evolved a

scheme of treatment which meets effectively the difficulty in such cases, and which is applicable also to any surface anthrax lesion. He discards entirely the cutting and destructive operations, and introduces the antianthrax serum directly into the body of the lesion itself by means of several small injections around the periphery of the eschar. He uses 7 to 10 Cc. locally once daily, and at the same time administers 20 to 40 Cc. intramuscularly, or intravenously, if the bacillus is found in the blood. At Bellevue Hospital, where this idea has been put into effect in a routine way, they have not been so conservative, for there they have used the serum intravenously in all cases, and have repeated the doses locally and in the vein every four hours for several days at a stretch without, so far as his knowledge goes, any serious or even especially unpleasant consequences. The results, though, have been no better than with Regan's method.

Surgical and Genito-Urinary Therapeutics

Treatment of Tuberculosis by Friedmann's Method.

FRIEDMANN (*La Presse Médicale*, Nov. 13, 1920) long since issued his first publication on an acid-resisting bacillus which he believed immunized against both bovine and human tuberculosis. A brief period of enthusiasm was followed by total neglect, incident, in part, to activities necessitated by the war. There has been a recrudescence of this method. The bacillus was isolated from the organs of a tortoise. It differs from the human bacillus in that it grows in a temperature of 13° to 42° C., in cold-blooded animals. A type of tuberculosis akin to the miliary one, with no evil effect upon warm-blooded animals.

Friedmann regards this organism as intermediary between that of the human bacillus and that of the fish. He holds that it is not only inoffensive to man, but

immunizing against both human and bovine tuberculosis. He has apparently shown this by laboratory work. Selter was unable to find antibodies after the injection of Friedmann's vaccine, nor could he produce the faintest sign of increased resistance against the human bacillus by this vaccine in his guinea-pigs.

Friedmann himself has carried his experiments to the human, namely, babies and the new-born. All his results which are indicative of the immunizing action are contradicted by those of Selter. Injections were made intramuscularly, and of living bacilli but one injection was required. Exceptionally a second one at the end of six months. Friedmann has given these injections to himself.

Thones, in surgical tuberculosis, has observed 68 cures in 75 cases. Ulmann and Kolliker report, in many cases, restoration

of function. Blumenthal reports nine cures of Pott's disease. Strauch failed to secure any results. Braun observed palpable betterment in sixteen cases, which he does not in the least attribute to his vaccine. Twenty-nine cases were unchanged and twenty cases were made distinctly better apparently from vaccine treatment. Eight cases were apparently made worse. Vaccination at first provoked an exacerbation of symptoms, sometimes well pronounced. Then there was a return to the ordinary condition, and finally functional cure. Braun advises against the routine use of these injections, but holds that they are serviceable in individual cases.

Stephan has made more than 600 injections without causing any trouble. Americans have as a rule received with skepticism Friedmann's communications.

La Presse Médicale asks whether or not this new treatment of tuberculosis is an enormous bluff. The suggestion is not without some clinical evidence in support of its value. The method must be regarded as still in its experimental stage.

Eighty-four per cent of the patients in the Wassermann-resistant group have undergone symptomatic arrest to-day under the treatment received. Paresis and tabes dorsalis with gastric crises formed more than half the failures.

The amount of treatment to which a Wassermann-resistant patient should be subjected cannot be exactly defined. The principles employed in making a decision, which are in effect the principles underlying the therapy of all late syphilis, are outlined. In particular, reversal of the Wassermann, while desirable, should not be the primary aim of the therapy. Symptomatic response, with arrest of the process, and the giving of as much treatment as to an early case, provided tolerance permits, are the important considerations.

A persistently positive serum Wassermann reaction seems to be an accompaniment of grave rather than of trivial syphilis. At least such is the case in enough instances to suggest the need for

the most painstaking and repeated investigation of the clinical aspects of the Wassermann-fast case. Premature statements based on insufficient evidence as to the insignificance of a fixed positive Wassermann reaction are to be deprecated.

Wassermann-fast patients should not be discharged from periodic careful reëxamination, with special reference to the cardiovascular and nervous systems throughout life. The frequency of such examinations should be dictated by the gravity and extent of the original process and the degree of apparent resistance to treatment.

Fracture Sprains.

SOHMER (*The Journal-Lancet*, Nov. 15, 1920) defines a fracture sprain as an injury of a joint, the result of trauma, which involves the breaking of a small fragment of bone, and is associated with a stretching or tearing of the ligaments of the joint, or the forcible avulsion of a tendon from its bony attachment.

It is important to recognize a fracture sprain, because of prognosis as well as treatment, which are decidedly different from that appropriate to common sprain. Correct appreciation of its presence will indicate a definite line of treatment and assure a good prognosis; if unrecognized, the subsequent disability and discomfort are decidedly greater. In common sprain rest for a short time with early massage and mobilization are indicated. In fracture sprain, however, the formation of excess callus with consequent deformity and disability must be avoided, requiring rest for a longer period and more careful passive and active motion.

Length of disability is usually longer in sprain associated with local fracture than in simple sprain; final results are usually perfect, with proper treatment. Joint tuberculosis is liable to develop after this type of injury in susceptible patients.

Treatment consists in adjusting and immobilizing the joint for a sufficient time, varying from four to eight weeks, depend-

ing on location and parts involved. Massage and passive and active motion should be instituted later in ordinary sprain, because the small size of bone fragment and the powerful leverage or traction of attached tendon and ligaments tend to displacement.

Position to relax muscles which exert unfavorable traction is important, and is necessary to perfect final results.

Frequent locations of fracture sprain are the joints of the phalanges of the hand and foot, the styloid process of the ulna, the lower end of the radius, the head and neck of the radius, the tuberosities of the humerus, the trochanters of the femur, the tibial cartilages of the knee, the tips of the malleoli, and the os calcis. More unusual are the tearing away of deltoid or quadriceps attachments of the humerus and the tibia, respectively, condyles of the humerus, the olecranon, the acetabulum of the ilium, the lower end of the tibia, and the astragalus.

Two Cases of Cancer Treated by Radium.

ROUILLARD (*La Presse Médicale*, Nov. 13, 1920) reports the case of a man sixty-one years old, given to alcohol and tobacco, exhibiting an indurated ulceration with elevated borders occupying the right tonsil and involving the cervical glands of the same side. Diagnosis of inoperable carcinoma of the pharynx was made, and twice each week radium was applied beneath the skin of the neck. In a month the tumor was diminished in volume. Treatment was continued for a year. Eight years later this patient was entirely well.

The second patient, a woman of sixty, showed a tumor of the breast adherent to the muscles, complicated by axillary ganglia. The breast was removed and the axilla cleaned out. A microscopic examination showed a scirrhus cancer with involvement of the ganglia and also of the cellular tissue of the armpit. The wound was cicatrized, but radium radiation was continued for a year. Thereafter a little

nodosity appeared on one of the ribs, which was further radiated. At the present time the patient is in perfect health, that is, more than eight years later, but recently suffered from cough and increase in the volume of the liver.

Renal Complications of Acute Lacunar Tonsillitis.

CRONK (*The Practitioner*, November, 1920) remarks of acute tonsillitis that it is a disease which may cause acute discomfort, but rarely or never threatens life. It may confine the sufferer to his bed for a few days, but unless a quinsy supervenes the severity of the symptoms soon subsides and work is resumed.

Its relation to acute rheumatism is now generally recognized after long and patient strife, but that inflammation of the kidneys is a complication, which in a mild form is far from rare, is not so well known as it should be.

The etiological significance of tonsillitis as regards nephritis is considered of little importance by older writers and by those who base their opinions on them, but in later years more attention has been directed to the throat as a source of infection. An extended review of the literature only goes to confirm these conclusions.

It may be difficult to distinguish cases of transitory nephritis, or so-called febrile albuminuria, arising in the course of acute infections. These cases are, however, to all intents and purposes cases of nephritis, and they only differ in degree from the more serious forms of acute nephritis arising in the course of the same illnesses.

During the investigation of 30 cases of acute lacunar tonsillitis two (or possibly three) were found to show urinary evidence of renal inflammation by the presence of cells and granular casts—the presence of hyaline casts was disregarded—in the centrifugalized deposit. This gives a proportion of about 7 per cent of cases with nephritis.

The infrequency with which systematic examination of the urine in cases of acute

lacunar tonsillitis is made, and the few signs that nephritis gives in these cases, account for the former opinion that albuminuria in tonsillitis is only of the febrile variety and that nephritis does not occur. If nephritis does occur, as many have now shown, then it is of importance that it should be recognized, since, although mild and not at the time dangerous to life, it is probably never completely cured. If this is so, the importance of systematically testing the urine in cases of acute tonsillitis for forming an ultimate prognosis is clear; no less important is the prevention or early cure of the disease when established.

Injuries to the Eye in Industrial Plants.

HUEY (*International Journal of Surgery*, December, 1920) notes that the outcome of these injuries depends in a great measure on the promptness with which they are attended to and the method used. It is common practice around the plants for some fellow-workman to render first aid to these minor cases, especially foreign bodies in the eye. This service is volunteered for the double reason of relieving the pain and to save time lost in quitting work to go to the doctor's office. A saving of an hour in this way often results in the loss of weeks of time, to say nothing of the hazard of losing the eye from an infection introduced by a toothpick or a match stem used by the workman in his efforts to remove the foreign body. A workman's hand covered with dirt and grease is not adapted for doing anything in which asepsis is required, and when attempting it with such a delicate organ as the eye disastrous results occasionally follow. It is not unusual to see an eye, in which attempts have been made to remove a piece of steel or emery from the cornea, with the epithelium denuded over an area several times larger than the foreign body. Such denudation of the corneal epithelium invites the entrance of bacteria with which the conjunctiva is at all times plentifully supplied, causing sometimes an infected ulcer.

Senile Painful Hip.

TUBBY (*The Practitioner*, November, 1920) under this title describes a disease which he says is characteristic of early advanced life, gradual in onset, slowly progressive, more common in men than in women, usually monarticular.

Underlying the articular manifestations of arthritis deformans, evidences of chronic toxemia, in nearly all cases, are to be found, if carefully looked for. The teeth and gastrointestinal tract are considered by Tubby to be mainly at fault. The exciting cause is usually some slight trauma, often a strain.

The earliest symptoms are some slight stiffness and aching in the hip-joint, especially after a hard day's work or prolonged and unusual exercise. Accompanying this, and never absent in the author's experience, is pain in the adductor region of the thigh and in that area supplied by the obturator nerve. As the disease increases, so does the pain in this area; then spasm of the adductor muscles follows, with some loss of abduction at the hip-joint on passive movement. By this time the disease is established. Next follow, in order, diminution of active and passive rotation of the joint, increasing loss of abduction, limitation of flexion, of hyperextension and circumduction; until, in advanced cases, total loss of mobility ensues. Long before this occurs it is possible to detect by palpation that the upper fourth of the femur is thickened, compared with the opposite side, and that shortening of the limb has occurred. Some cases developed coxa vara, and about 20 per cent complain of pain in the sciatic nerve, which is often called sciatica, and treated as such.

Treatment may be summarized under four headings:

Ascertain and treat any cause of chronic toxemia.

Neutralize the effects of any chronic irritation of the joint, such as the static effects of a shortened limb.

Diminish intra-articular pressure, whilst conserving the movements of the joint.

Auxiliary means of treatment such as

counter-irritation, massage, vibration, ionization, electrical modalities including the static wave, static breeze, etc.

How is it possible to lessen intra-articular pressure, whilst preserving movement in the joint?

In cases of moderate severity in which walking is painful, the best course is to advise the patient to lie in bed from four to six weeks, with weight extension on the limb, acting from above the knee, as well as from the ankle. It is better to apply weights to both legs, in the proportion of three for the affected side to two for the normal side.

In any case, gentle passive movements of the joint may be carried out five to ten times on one and on not more than two occasions daily. If they cause increased pain or additional spasm, too much is being done, and less movement is called for.

When the adductor pain has subsided, the pain in those muscles is lessening, and the degree of flexion is increasing, then the lying-up treatment is relaxed; the patient is allowed to get up for some hours daily, wearing, however, mechanical arrangements designed to permit movement of the hip-joint with a diminution of the intra-articular pressure.

Recent Considerations in the Management of Fractures.

MOORE and SMITH (*The Military Surgeon*, December, 1920) after a brief study of the management of fractures urge the importance of the following points:

That the treatment of fractures by a combination of traction and suspension is of the greatest usefulness in cases of the civil type and is the method of choice in the great majority of fractures of the shaft of long bones.

The earliest possible reduction or other definitive treatment of fracture is imperative, regardless of the amount of swelling or any other condition except shock.

In any community where fractures occur in large numbers they can be treated most satisfactorily on special fracture services.

A standard equipment consisting of a few simple splints and accessories such as that adopted by the United States and British armies leads to the most satisfactory results in the treatment of fractures received in civil life as well as in war.

Well-equipped departments of hydro- and electrotherapy, physiotherapy, and occupational therapy are necessary auxiliaries of a fracture service.

The fullest coöperation between the surgeon and the radiologist is essential. A portable bedside x-ray equipment is necessary for the best treatment of fractures by the suspension and traction method.

Hyperesthesia of the Vesical Neck in Women.

FOOTE (*Urologic and Cutaneous Review*, November, 1920) after discussing the frequency with which this disease is observed and the comparative rarity with which it is described in text-books observes that the treatment of this condition is usually simple and effective. In his experience good results follow gradual dilatation of the urethra every three or four days, with regulation of the diet, the use of cocaine in some cases before the dilatation when the hyperesthesia is extreme, sedatives, preferably the bromides, for a few weeks or perhaps during the time the treatment lasts, and as these cases are usually neurotics and suggestible, a positive statement made that they will be relieved. Some cases relapse, but as a rule the results have been extremely gratifying.

Cauterization of the neck of the bladder with silver nitrate is only indicated in a few intractable cases.

Kelly is skeptical as to the benefits of gradual dilatation. It is rarely necessary to resort to divulsion of the urethra; this should be used only when everything else has failed. In some cases, especially where pain is a prominent symptom, the author has obtained relief by using the high-frequency current with one electrode in the bladder.

Acute Appendicitis and Acute Appendicular Obstruction.

WILKIE (*Edinburgh Medical Journal*, November, 1920) observes that the practice of submitting patients suffering from acute appendicular disease to early operation has of late years afforded surgeons the opportunity of observing the pathology of the initial stages of the disease. This study has shown that altogether different primary lesions may, if permitted to develop, lead to the same final result of perforation and peritonitis. To attain to accuracy in early diagnosis, it is essential that we learn to correlate the initial symptoms with the primary lesions—in other words, to have a rational basis of pathology on which to found the symptomatology of the disease.

The wall of the appendix, being rich in lymphoid tissue and exposed to a content full of microorganisms, is particularly liable to attacks of inflammation just as are the tonsils. As might be expected, primary inflammation of the wall of the appendix is associated with malaise, a certain rise of temperature and of pulse-rate, with nausea and, it may be, vomiting, and with pain more or less severe in the lower abdomen gradually settling on the right side as the parietal peritoneum in that region becomes irritated. The appendix being a hollow viscus is, however, also liable to have its lumen obstructed, and a sudden obstruction of the lumen of the appendix may, under certain conditions as regards its contents, lead to changes much more striking than those associated with inflammation of its wall, and moreover that these changes produce a train of symptoms distinct from those of inflammation, and such as one would expect in obstruction of a blind hollow viscus.

Causes of acute appendicular obstruction are the impaction of a concretion either in a stenosis the result of a previous attack of appendicitis, or at a kink in the appendix due to tacking down at some point by an adhesion or a congenital fold of peritoneum. Of kinks the one most frequently encountered is that where the genito-mesenteric fold ties the appendix at some point, usual-

ly in its middle third, downward toward the pelvic brim. Apparently in these cases the entrance and exit of fecal matter to and from the distal part of the appendix is impeded by the stenosis or kink, and fecal matter when it has gained entrance is liable to remain and become hardened to form a concretion. From time to time the concretion may lead to temporary and abortive attacks of obstruction, the patient experiencing appendicular colic. On one occasion, however, more fecal matter gains entrance beyond the narrowed zone, the appendix contracts to expel it, but instead forces the concretion into the stenosis or kink. If the concretion does not disengage itself promptly the fermentation of the fecal matter increases the tension behind it and effectively ball-valves the exit in a manner similar to that of a soda-water bottle. Progressive fermentation and distention with inevitable gangrene and perforation follow unless the process is cut short by surgical intervention.

In some cases the sudden onset of symptoms so characteristic of the malady may develop without any previous history of trouble in the appendix region. In many cases, however, careful inquiry will elicit a history of intermittent colicky pains or of occasional "bilious attacks" with more or less pain in the right side of the abdomen.

In a few cases "indigestion" after eating green vegetables has been the only previous suggestive symptom. The acute attack begins suddenly with acute pain in the umbilical region, frequently accompanied by vomiting. Whilst in a number of cases it has been noted that the pain commenced during or just after some physical exertion, in quite a large number it set in at night whilst the patient was in bed, waking him out of sleep. The pain is of an acute colicky nature, and to begin with is intermittent, coming on in spasms. After a short time, however, it is constant, but is aggravated by more acute spasms from time to time. Perforation of the distended appendix is commonly marked by a temporary relief from pain, the patient expressing himself as being much easier, although a rising pulse-rate indicates a spreading peritoneal

infection. For the first few hours (it may even be twelve hours or more) there may be no rise in the temperature nor in the pulse-rate, and negative observations under these two heads must be disregarded entirely if early diagnosis is to be made.

The facies of the patient often gives help as it expresses anxiety, and he is usually conscious that there is "something wrong inside" and welcomes the suggestion of surgical interference.

For diagnosis, however, we must rely mainly on the physical examination of the abdomen. Cutaneous hyperesthesia in the right lower quadrant of the abdomen is usually present in the early stages, although it may disappear once the appendix has perforated. Rigidity of the lower half of the right rectus muscle is almost always present, as is tenderness on pressure in this region. Most difficulty is encountered where the obstructed appendix is lying high up in the retrocecal region, but even here some hyperesthesia of the skin above McBurney's point, together with tenderness in the lumbar region posteriorly, and a normal urine, incriminate the appendix. The importance of making a diagnosis on the local signs cannot be overemphasized; because in these cases to wait for changes in the temperature or the pulse-rate so frequently means delaying until the gross pathological changes have supervened and the danger zone has been entered.

A Group Study of 300 Cases of Arthritis.

HARDING (*California State Journal of Medicine*, January, 1921) observes that in young adults arthritis is an infectious disease, systemic in character, with local manifestations, in which joint trauma plays a large part—often the most important part.

The outline of study of each case able to make the rounds afoot or in a wheel chair was as follows: History and general examination in the ward; 24-hour urine saved. Blood for culture, Wassermann, and cell count taken by the laboratory tech-

nician. X-ray of teeth, sinuses, lungs, and affected joints if chronic. In fresh acute cases the joints were not usually taken, since the findings were uniformly negative. The sinus roentgenographic report accompanied the patient to the nose and throat department, where the same medical officer saw all the arthritis cases. The dental films were sent direct to the dental officer doing out-work, to which department the patient was next sent. The genito-urinary department went exhaustively into the venereal history and made all the standard tests, using the cystoscope if any findings warranted it.

Orthopedic examinations were made in the ward. Lung, heart, gastrointestinal and nervous symptoms, if found, received examination by specialists in their respective lines. Each examining officer was required to fill a proper blank with his findings and to sign the same at the time of examination.

In 89 per cent of the cases some infectious process other than that in the joints themselves was found and treated. In 57 per cent of the cases more than one infectious process was found; 51 per cent in the tonsils; 31 per cent in the teeth; 12 per cent in the prostate; in 9 per cent gonorrhea was present; a positive Wassermann in 4 per cent; sinus infection in 5 per cent and pyorrhea in 3.2 per cent; tuberculosis of the lungs in 2 per cent.

The blood cultures were all negative.

The well-known observation that rheumatics are anemic was abundantly borne out, and as a consequence hematics were generously administered to most of the patients.

The urine followed typical febrile curves in acute cases, while a trace of albumen was not rare. No case of kidney trouble arose, though polyuria was often pronounced during the administration of large doses of salicylates.

From a clinical standpoint a few observations are of interest. Ninety per cent of these men had had a previous attack. This is of importance in that they were

all young men, which points to the similarity to tuberculosis in the childhood invasion of lymphatics and synovial tissues. Arthritis in the child calls for a painstaking cleaning up of all sources of infection, for he will otherwise most certainly have other attacks later in life.

Heart complications were rare, and though on the lookout for them not more than a half dozen were found.

The absence of gastrointestinal diseases proved a surprise to every one. Not a chronic gall-bladder nor appendiceal infection was found in the entire series.

The question of sinus infection caused much dispute. The roentgenologist reported positive findings, with increased density, in many cases, but the most painstaking and repeated examinations by the rhinologist failed to find inflammation in but 5 per cent.

In a dental way nothing less serious than a root abscess was considered a probable cause. On the whole, the cleaning up of the dental conditions seemed to give more prompt relief than tonsillectomies.

The genito-urinary studies proved to be an eye-opener. About 25 per cent of the cases came in diagnosed as gonorrheal rheumatism. The 12 per cent of inflamed prostates, and 9 per cent actual gonorrhea found, represent with a few exceptions the same men, and is not much above the average of the draft. The typical monarticular gonorrheal arthritis or periartthritis was very rare; it made up not more than 2 or 3 per cent. The bulk of the cases having a demonstrable gonorrheal focus presented the same varied types of arthritis as the non-gonorrheal.

Luetic arthritis proved, as expected, a small factor.

The acute case was confined strictly to bed, his bowels opened with calomel, and all painful joints splinted. Chicken wire and plaster of Paris formed as much a part of their armamentarium as salicylates and surgery. No part of the care of acute rheumatism is so neglected in civil practice as adequate splinting. If there were no

heart complications, and the heart did not distress him, he was put up in an electric cabinet and sweated daily for a few days. Thoroughly carried out, this usually gave much relief. Sodium salicylate and sodium bicarbonate were given nearly all acute cases in the following manner:

A stock mixture containing two grains of bicarbonate to one of salicylate was prepared. The daily dose was from 200 to 400 grains of salicylate divided into six doses, and each taken in a pint of water. The patient then had a pint bottle of water placed by his bed, which he must drink before the next dose. Many drank much more. This was never continued more than three days. Therein lies the secret of successful salicylic medication — saturate, then stop. Very few had any gastric trouble as a result. If so, they were medicated per rectum.

As soon as the acute stage was passed the men were overfed, as was done in tuberculous patients, and were given iron. The necessary surgery was attended to as soon as they were able, at once in chronic cases. Intravenous triple typhoid vaccine was given for the non-specific protein reaction in 17 cases. Harding's results in this small number were unfavorable.

The chronic cases, in addition to surgery, were given much local treatment, consisting of high temperature, baking, massage, and graduated exercise.

It is at this point that the most careful judgment must be used as to when to abandon a policy of rest and protection for an inflamed joint surface; and to introduce active motion and use to clear up periarticular congestion and thickening. Permanent roughening may be caused by too early use, while stiffness and atrophy result from too long disuse. A safe guide is the production of pain on voluntary motion. A patient will rarely damage his joint by activity which is not distinctly painful. On the other hand, to force a painful joint by passive motion is only to invite more trouble.

As to the Alpine sun lamps now so

widely advertised. Having little sunshine in Washington, extensive use was made of them as a substitute. The author is convinced that in joint diseases their value is solely as a counter-irritant. As such they should be used to produce a blister of desired size and location. The skin should be prepared surgically, the burning done—which is painless—and a sterile dressing applied. He often raised blisters of 20 square inches on the knee with excellent therapeutic results.

The average stay in the ward was forty-two days. Of the acute cases 79 per cent were discharged to full duty as cured, 21 per cent as improved. The chronic cases, of course, were not so favorable; 45 per cent were classified as cured and returned to full duty; 40 per cent were improved.

From the standpoint of arthritis sudden and brilliant cures from the removal of an infectious process are not common, although they do occur. In addition to the tonsils, teeth, etc., the lymphatic chains and the joints themselves are independent infections.

Carcinoma of the Prostate.

BUMPUS (*Surgery, Gynecology and Obstetrics*, January, 1921) has made a study of 362 cases of carcinoma of the prostate observed at the Mayo clinic during the years 1914 to 1919 inclusive. Of these 79 (21 per cent) showed evidence of metastasis. The majority of the cases are associated with hypertrophy of the gland. There are two types of enlargement, although many intermediate types occur. In type 1 the gland is so slightly enlarged and gives so few local symptoms that it is often discovered only because of symptoms produced by metastasis. Even in the late stages of the disease the local growth does not become extensive.

The enlargement is generally uniform, without any of the irregularities of contour presented by the common type of carcinomatous gland. Characteristic stony hard areas are absent as a rule. Although there may be localized areas of greater density,

the gland as a whole presents a lack of resilience rather than a stony hardness and resembles true inflammatory hypertrophy, with which it is often confused, although in the latter case resilience is not lost. The gland is never so large that it cannot be outlined by the examining finger.

In the more common type of carcinomatous prostate (type 2) the gland may present any degree of enlargement according to the duration of the disease, but the topography encountered by the examining finger is always the same, irrespective of variations in size. The contour of the gland, palpated through the uninvolved rectal mucosa, is irregular, the surface is elevated at different points by masses, which, when examined individually, fail to give any sense of elasticity and have been characteristically described as of stony hardness. These masses of carcinoma, palpated through the normal or hypertrophic gland, compressed as a result of their growth, resemble nothing so much as the pit of a plum felt through the unripe fruit. As the disease advances these areas coalesce and the entire gland assumes this stony hardness, but if examination is made early in the disease, the involvement may be felt as individual areas. Because carcinoma of the prostate is primarily an infiltrating growth and produces destruction and necrosis only in its later stages the localized growth becomes large. It spreads upward into the seminal vesicles beneath Denonvillier's fascia (which extends from the triangular ligament over the posterior surface of the prostate to the peritoneum as a tense fascial plane covering the prostate and vesicles), at first involving the soft tissues adjacent to the ejaculatory ducts and lower end of the vas deferens beneath the bladder trigone, and later invading the interior of the vesicles. This method of extension results in a unicornate or bicornate growth, depending on whether one or both vesicles are involved, often so large as to cause considerable rectal obstruction, and in the terminal stages not only obstructing the bowel and making im-

possible any accurate determination of its extent by rectal palpation, but also involving the entire pelvis and often palpable suprapubically. The rectal and urethral mucosa is broken through only in the later stages, a fact which explains the very low incidence of hematuria.

There is little doubt that of the two types the smooth, firm, well encapsulated carcinoma, which on rectal examination because of its small size seems to present ideal conditions for obtaining gratifying results with radium therapy, offers the graver prognosis. Probably better results may be obtained from treating the larger type of growth prior to the occurrence of metastasis which takes place late in such cases. Even when the small gland is treated early, it is doubtful whether so good a result may be obtained as in the large gland because of the potential malignancy of the cancer cells in the former.

The absence of macroscopic hematuria as a first symptom in the cases with metastasis compared with its occurrence in only five of a large series of cases without metastasis is striking. Another noteworthy difference is the occurrence of retention as a first symptom in only one case with metastasis and in nine cases without metastasis. These two differences are undoubtedly attributable to the same cause, namely, the tendency of the carcinoma in cases without metastasis to grow locally, producing obstruction, and finally eroding the urethral mucosa, while the small gland found often in the cases with metastasis produces little obstruction and results in death from metastasis before erosion has occurred. When the urinary symptoms are studied alone throughout the disease, the same probable causes and general deductions become apparent. Retention occurs in 25 per cent of the cases with metastasis and in 33.9 per cent of the cases without metastasis. Macroscopic hematuria, which was entirely absent as a first symptom in the former group, appears as a later symptom in twice as many cases without metastasis as with metastasis. These facts show con-

clusively the nature of the two types of carcinoma of the prostate; the one exhibits a tendency to remain localized and produce urinary symptoms, while the other quickly spreads to various parts of the body, with little tendency to localized growth, and results in death from metastasis. Of the patients with metastasis 11.5 per cent have no urinary symptoms, in comparison with 3.8 per cent in the patients without metastasis.

The age of the patients and the duration of the disease correspond closely to the statistics of other authors.

One-third of the patients with carcinoma of the prostate have osseous metastasis demonstrable by the roentgen-ray.

The pelvis and spine are the most frequent sites of osseous metastasis.

Metastasis occurs rarely in the lungs, probably never without involvement elsewhere.

Metastasis to the spinal cord from carcinoma of the prostate closely simulates primary cord tumors and often occurs when the prostate is but slightly enlarged.

Pain is absent in one-fourth of all cases with metastasis.

Urinary symptoms are absent in 11.5 per cent of all cases with metastasis.

Neuralgic and rheumatic pains in men above middle age, even in the absence of urinary symptoms, should suggest the possibility of carcinoma of the prostate.

Pleural Reflex.

CASTLE (*British Medical Journal*, Dec. 18, 1920) reports the case of a woman operated on for empyema with a resultant sinus leading up to the root of the lung. On one occasion syringing this sinus was followed by collapse, yielding to brandy and oxygen. Many months later the sinus was again syringed with Dakin solution. This was done for several days. On the fifth day the patient again collapsed during the injection. She was put to bed pulseless, with feeble respiration. With brandy and oxygen she recovered, but was completely

blind. Presently she began to vomit. This continued for twelve hours. The blindness persisted for twenty-four hours. After this the return of sight was gradual. Castle explains this on the basis of an anemia of the occipital lobes, an explanation not completely satisfactory.

The Resistance (or Immunity) Developed by the Reaction to Syphilitic Infection.

BROWN and PEARCE (*Archives of Dermatology and Syphilology*, December, 1920) note that in the experimental infection produced in the rabbit in scrotal or testicular inoculations of well-adapted strains of *Spirochæta pallida* the two most striking features are an extremely marked reaction at the site of inoculation and a total absence of generalized manifestations of the disease. The absence of generalized lesions in the rabbit cannot be accounted for either by a lack of dissemination of spirochetes or by a tissue insusceptibility.

This suggested a line of experiments with a view to determining the effect which a simple reduction or suppression of the reaction at the site of inoculation might have on other clinical manifestations of the infection.

Of twenty rabbits inoculated in both testicles, fourteen were castrated and six were held as controls. Generalized lesions developed in one of the six controls and in thirteen of the fourteen castrated animals.

Twenty-seven rabbits were inoculated in one testicle only; fourteen of these were castrated and thirteen were held as controls. In this series, generalized lesions developed in eight of the thirteen controls as contrasted with one of six animals inoculated in both testicles, and again in thirteen of the fourteen castrated animals.

The effect of suppression of the testicular lesion by the use of a therapeutic agent was tested. A drug was chosen whose specific action seems to be toward inducing resolution of the lesion. Its name as given by the author is arsenophenylglycyl dichloro-m-aminophenol.

Twelve rabbits, six of them inoculated unilaterally and six bilaterally, were given a single intravenous injection of this drug (5 mg. per kilo) fourteen days after inoculation, and the results were controlled by six untreated rabbits from each of the respective groups.

In the unilateral series, the lesions present were almost completely resolved and the local reaction suppressed for between two and three weeks. At the end of three months all of these animals had developed generalized lesions as contrasted with three of the six controls.

This experiment, the authors hold, showed that by properly gauging the dose of a therapeutic agent so as to suppress the lesions present without destroying the infecting organisms, the infection can be intensified in the same way as by an excision of the primary lesions.

In another experiment the reduction of the reaction at the site of inoculation was carried to the point of complete prevention. This was accomplished by inoculating ten rabbits in the right scrotum, using tissue implants, and at the end of forty-eight hours completely excising the scrotum and testicle of that side under ether anesthesia.

By the end of the seventh week, eight of the ten rabbits in this series showed a marked generalized syphilis, and the other two developed slight generalized lesions at the end of two and two and one-half months.

Taken as a whole, the generalized infection in this series of animals was the most pronounced which the authors had seen in any single group of rabbits. This would indicate that both the incidence and severity of the generalized infection tend to increase in proportion to the reduction or suppression of the reaction at the site of inoculation.

These experiments show that, in so far as syphilitic infections in the rabbit are concerned, the reaction which takes place at the site of inoculation tends to dominate the entire course of the infection; that, in effect, this reaction either inhibits or obviates the necessity for the development of

lesions elsewhere, and, conversely, that the reduction or suppression of the reaction by the use of any means that does not exercise an equal effect on the organisms themselves removes this control and tends to increase the occurrence of generalized lesions and the severity of the infection.

If one is prepared to accept the infection produced in the rabbit by *Spirochæta pallida* and the reaction to infection on the part of the experimental animal as analogous in kind to those in man, these observations become of far-reaching importance and may open the way to a better understanding of many problems of human syphilis.

Injuries to the Ankle Joint and Their Treatment.

COOPERMAN (*Medical Record*, Jan. 1, 1921) notes that in mild sprains three or four hours may elapse between the time in which the trauma was sustained until disability ensues. In the interval many of these patients attend to their duties without discomfort. After this period, pain at certain regions of the ankle joint, stiffness, and some swelling develop. The more severe injuries to the ankle joint are exceedingly painful and troublesome in their consequences. At the time of the sprain, a certain amount of blood is effused into the joint cavity and the surrounding tissues, in consequence of which the limb in a few days becomes discolored for some distance below and above the joint. The sprain is rapidly followed by swelling and inflammation of the joint and surrounding tissues, often very chronic and tedious. As the inflammation subsides, stiffness and pain in using the part sometimes results.

The diagnosis of ankle sprain rests upon, first, a history of the injury; second, the physical findings; third, *x*-ray examination.

All ankle sprains of moderate severity should be *x*-rayed. Very often what is considered a sprain may, on *x*-ray examination, reveal a fracture. A sprain being a general term applied to all possible injuries that may occur to the soft structures of this

joint as a result of a wrench or twist of the foot, it would be an advance in diagnosis, as well as in applying appropriate treatment, if through an accurate knowledge the structures injured could be identified.

The period of disability of ankle sprains depends upon the severity of the trauma and upon the treatment that was instituted. A neglected or badly treated ankle sprain leads to chronic sprain. A chronic sprain is characterized by pain in the region of the ankle, under either malleoli, swelling, and a sense of weakness. Patients tire easily. Chronic sprains, after a time, produce certain bone changes. New facets are ground upon previously healthy bone, and the feet are very often distorted to produce pronation or other deformities. The pain of a chronic ankle sprain is sometimes reflected to the knee, hip, and lower back.

Traumatic flatfoot is a condition sometimes resulting from injuries to the ankle joint. The arches are depressed and there is pronation deformity. There is often a passive congestion of the foot and leg. The feet are discolored, cold, and sweaty. If, in addition, there is an infectious element, there may be present an arthritis in the joints of the foot. The muscles atrophy.

Ankle sprains being of such common occurrence, treatment, in a great many instances, is inadequate. It is not surprising in an orthopedic clinic. Lotions, liniments, ointments, tincture of iodine, and the like, employed so commonly in these cases, very often prolong disability and jeopardize the future comfort of the patient. These should not be employed in acute injuries to this joint.

The iced compress, lead water and laudanum applications, and elastic compression of the joint are commonly employed in contusions and sprains. These dressings are beneficial in mild injuries. They very often relieve pain, limit inflammation and swelling. Another measure that is useful in these mild injuries is the immersion of the foot and ankle in hot water to which has been added a half-pound of magnesium

sulphate. These immersions are repeated every three hours. It is surprising how quickly some patients gain relief. The circulation of the joint is improved and the small amount of effusion is rapidly absorbed. Some of these patients are able to go about without any further disability within two or three days.

By far the most effective treatment in all degrees of ankle sprains is immobilization of the joint by either adhesive strapping in the mild cases or plaster-of-Paris dressing in the severe cases. In this method of treatment all indications are met. The cure of these injuries is based upon sound physiologic principles.

Concretely stated, one should be guided by the following rules in the treatment of these cases: First, relax the torn or stretched soft structures by reversing the movement followed by the traumatizing force, and immobilize the joint in this position. Second, maintain this position of the ankle until healing of the soft structures has been completed. Third, improve the circulation of the injured part by the use of superheated air, massage, and mild, passive movements. Fourth, early functional use, allowance being made that no strain be put upon the newly formed fibrous tissue.

Before one attempts to put on adhesive strapping, it must be determined which structures are damaged, and the dressing must be applied so as to relax them and maintain apposition of the torn tissues as far as possible. What is essential to the correct application of this dressing is that one have an understanding of the mechanics of the condition for which it is applied, and that each strip of adhesive plaster be applied under tension enough and in such position that it have a real mechanical effect. Thus in case of an injury to the external lateral ligament or its divisions, those are to be relaxed; since adduction and supination is the direction in which the foot was twisted, the foot must be strapped in such a way that it is held in abduction and pronation. It is further important that

the foot be strapped more firmly than is apparently necessary, in order that allowance be made for slipping on the skin which always takes place, but particularly when the foot is used to walk or stand.

There are required for a typical dressing seven strips of plaster—four are eighteen inches long and one and a quarter inches wide, and three are ten inches long and one inch wide; it is also desirable to include a pad of felt one-quarter inch thick, two inches long, and one and one-half inches wide, the latter to be applied in the region of the sprain, to produce pressure upon the local lesion. Instead of a felt pad, several thicknesses of adhesive plaster can be made, the measurement of which should be practically the same as the felt pad. Sir Robert Jones advises the use of this adhesive pad with the sticky side out.

Before the adhesive straps are applied, the leg should be cleansed thoroughly and shaved. The foot should be placed at right angles to the leg, and either everted and pronated in cases of external ankle sprain, or supinated and adducted in cases of internal ankle sprain.

To illustrate the application of adhesive strapping, we may take an injury to the external lateral ligament. The pad of felt or adhesive is first applied to the region traumatized and held there by an assistant. A long strip is then applied to the dorsum of the foot, beginning at the outer margin of the scaphoid and external cuneiform bone and in front of the astragalo-scaphoid joint. It is made to adhere, pulled taut, and passed inward around the inner border of the foot and obliquely across the sole, escaping the tuberosity of the first metatarsal, and passed up to the external malleolus. At this point the adhesive or felt pad is made to adhere to this strip. Being constantly held taut, the strip is now passed upward and slightly inward and made to adhere for the rest of its length over the front of the tibia. A short strip is now taken and its end made to adhere to the base of the first metatarsal, and it should be passed horizontally around the back of

the heel and along the outer border of the foot, ending at the articulation of the cuboid with the fifth metatarsal. It should cross the first strip at right angles, just below the tip of the external malleolus. In passing it, this strip should be pulled upon sufficiently to abduct the foot. The second and third long and short strips are now applied so as to overlap the others by one-half. The fourth long strip should begin about three or four inches above the internal malleolus, pass across the sole of the foot to the external malleolus, and vertically upward along the external border of the leg, finally ending a little below the head of the fibula. To complete the dressing, and secure adhesion of the plaster, it is well to apply a bandage to the entire foot and leg, passing this also in such a direction as to secure the desired position of the foot.

A Simple Method of Treating Flatfoot.

BRADFORD (*International Journal of Surgery*, December, 1920) alludes to a method of treating flatfoot employed in the British medical service which received the indorsement of Sir Robert Jones, who stated that all cases which submitted to this treatment for a month were for all practical purposes cured. The method, it will be remembered, consisted of twenty minutes daily exercise, walking on the specially prepared rounds of a ladder placed upon the ground. This method is admirably adapted for military service, but it requires space on the floor of a gymnasium rather than in a doctor's office.

In addition to the value of giving to the medical world a simple method of treating a common affection, the article was of interest, calling attention as it did to the fact recognized by some but overlooked by many orthopedic surgeons, that the better way to treat the ordinary flat foot was by strengthening the foot muscles rather than by the muscle-weakening use of arch supporters or by lacing the foot tightly in a box-like boot.

Following the suggestions contained in

the article mentioned the writer has made use of what seems an even simpler device. The purpose of the ladder-walking treatment was to develop the strength of the foot muscles by giving an unusual obstacle at each step, thereby strengthening the foot and leg muscles by the necessary balance effort and toe clutch. In place of obliging the patient to walk upon the rounds of the flat ladder, the round can be attached to the flexible sole of a moccasin. In this way the patient is not obliged to walk in any prescribed space, but can carry on his daily exercises as well at home as in a place large enough for the special ladder. A piece of wood is shaped so as to present under the sole a rounded block, while on the floor surface it is better flattened to give steadier footing. The height of the wooden block is a matter of judgment. It should not be so high as to make walking too difficult, while the obstacle to the usual gait should be sufficient to furnish adequate foot-muscle exercise. The block should be attached to the moccasin so as to press behind the ball of the foot. If it is farther forward or under the arch of the foot it does not give enough toe flexion. If it is higher on the inner than on the outer side the patient will be more inclined to walk toeing out. The block can be attached to the sole of the moccasin and tacked to the sides, or the block can be nailed to a piece of leather which is stitched to the under side of the moccasin.

The acquired deformities of the feet in their different developments necessarily require a variety of forms of treatment. This statement is intended only to call attention to a simple device of service in meeting certain indications.

Control of Venereal Disease.

Under this heading (*Lancet*, Dec. 25, 1920) is noted a statement issued by the Medical Women's Federation to the effect that after careful consideration in all its bearings of the question of self-disinfection before and after sex intercourse, it is of opinion, apart from the serious moral

responsibility involved, that on purely physical grounds there are serious objections to this method and to teaching its use to the public.

It would be most undesirable to teach young boys and girls to tamper with their own sex organs, yet if it were efficient the method would have to be carefully and minutely taught to quite young boys and girls, even before puberty.

It would not be desirable to teach every married woman to regard her husband as possibly suffering from venereal disease and to take precautions accordingly; nor would it be possible for every bride to carry out the instructions given, yet disease among married women forms a large percentage of the whole.

The Medical Women's Federation believes that these methods are impossible for the majority of women to practice as recommended. Though a woman may be told to lubricate the vulva, in very few instances would the vagina and cervix be effectively treated. As is well known, infection both in the case of gonorrhea and syphilis may take place at the cervix. The young are the most sought after, and the most readily infected, and hence they are the most dangerous as regards the further spread of infection, and they are the people who would find it most difficult to carry out the method.

The means advocated, if properly carried out, are contraceptive. The Federation is not prepared to indorse the introduction of contraceptives broadcast to the public or to recommend contraceptives for "self-disinfection" when the action of such substances may not even be known to the user.

Chronic Urethritis.

KOLL (*American Journal of Surgery*, December, 1920), after discussing the underlying factors which favor the continuance of urethral infection, observes that a primary non-gonorrheal urethritis does not often become chronic, but the continued infection may be due to the

influence of one or more of the pyogenic bacteria gaining entrance to the urethra through its lowered resistance following a gonorrheal infection. The bacillus coli and staphylococci in combination are more resistant to treatment. They may be exterminated and the mucous discharge may still persist, until the lesion producing it is localized. Finally it must be admitted that there are some cases, fortunately in the minority, in which, despite every rational means of therapy, the "morning drop" will persist. If no pathology is determinable and the urine shows only mucous shreds, the patient should be frankly told that he can never be freed from the condition, but that no harm can ever result from it, either to himself or to a prospective wife. This statement is made with the reservation that the points mentioned are taken into account.

In considering the treatment the patients should be divided into three groups: those in whom the urethral affection is a simple diffuse chronic hyperemia, with slight epithelial exfoliation, manifested by shreds in the urine; those who upon urethroscopic examination show localized lesions along the urethra such as fissures, ulcers, granulations, etc.; utriculitis and verumontanitis; those in whom the prostate or seminal vesicles or both are the offenders.

For the first group, the passage of sounds, followed by instillations of silver nitrate $\frac{1}{4}$ per cent to 1 per cent and massage of the urethra, is the programme to be carried out.

Any of the localized lesions in the second group should be touched with silver per endoscope; beginning with 10 per cent and increasing to 25 per cent, or even the pure stick made into small molds for this purpose and carried by the Young porte caustique. For gaping Littre glands and for any involvement of the utricle, direct injections 1 to 3 per cent silver are made with the Geraghty syringe.

For the third group, systematic stippling of the vesicles and massage of the prostate should be carried out. This can be fol-

lowed by deep instillations or irrigations; in the writer's opinion these procedures have little value, but they can do no harm. When after a reasonable length of time conservative measures fail, vasotomy should be performed. In the writer's experience in approximately 75 per cent of the cases satisfactory results are obtained. Vesiculotomy is condemned as a difficult and serious operation and not productive of any results.

If the discharge shows an admixture of either colon bacillus or the staphylococcus, for the former organism $\frac{1}{2}$ per cent solution of aluminum acetate gradually increased to 2 per cent upon tolerance is effective. For the other organism 1:5000 solution of mercury oxycyanide is almost specific therapy.

Principles of Drainage in Empyema.

BINNIE contributes a brief but admirable article on this subject as abstracted in the *Illinois Medical Journal* for January, 1921. There is a great similarity between the pleura and the peritoneum. In both these cavities inflammatory affections are essentially secondary to diseases of the contained viscera and are attempts to limit or cure the primary lesions. In the abdomen the primary lesions are usually limited in extent (*e.g.*, appendicitis or duodenal ulcer). If nature's methods are not interfered with by neglect or still worse by injudicious treatment, the secondary peritonitis walls off the disease and may result in resolution or in the formation of a local abscess. The lesions being limited, early operation is well calculated to lead to prompt and permanent cure.

Empyema is usually the result of pneumonia. As a result of the pneumonia, changes take place in the pleura more or less similar to those seen in peritonitis; effusion; exudates; formation of adhesions. These are evidences of attempts to limit the disease, and when not in excess are useful. When pus is found in quantity, the previously protective pleuritis becomes in itself a danger. While the primary or pul-

monary disease is active, interference with the pleural condition is wrong, except when that condition is excessive, and then the excess alone should be attacked by aspiration, which may require to be often repeated. When the empyema persists, then the pus must be removed.

It is needless in this abstract to discuss the common and often useful and successful methods of treatment by puncture, with sterilization by means of Dakin's solution or by incision with removal of pus and fibrin, after which the pleura is filled with iodoform emulsion and closed without drainage.

The principles of drainage alone need interest us at the present. One must remember that adhesions may cause encapsulation of the pus in one or several places, and hence that exploratory operation is often necessary. One must also remember that the costo-diaphragmatic angle is often obliterated by adhesions. The classic operation for empyema is to establish drainage at the fifth or sixth rib in the posterior axillary line, but this position does not correspond to the low point in the pleura whether the patient is lying or sitting. One must remember that on each side of the vertebral column a gutter exists which can only be drained by an opening at the angle of a rib, the patient being in the dorsal decubitus. The most thorough method in which to obtain drainage, whether the patient be lying or sitting, is to make a free opening at the level of the fifth or sixth rib, to find the low point (for any decubitus) by means of exploration with the finger or forceps, and there to establish drainage. The primary opening may be used for the insertion of Carrel tubes or may be left alone.

Some surgeons endeavor to obtain sterilization of the cavity by means of air or oxygen passed through ether or formalin and introduced into the bottom of the pleura through the drainage tube. If drainage has been established on the principles enunciated sterilization of the cavity is usually unnecessary.

Reviews

THE PRINCIPLES OF IMMUNOLOGY. By Howard T. Karsner, M.D., and Enrique E. Ecker, Ph.D. Illustrated. J. B. Lippincott Company, Philadelphia, 1921. Price \$5.

Dr. Karsner and Dr. Ecker, respectively Professor of Pathology and Instructor in Immunology in Western Reserve University, have presented us with about 300 pages dealing with this important topic, which is constantly broadening in its scope. Their idea has been to present a concise statement of the facts and more important hypotheses concerning resistance to infection. The text is designed primarily for students of medicine and for those practitioners whose duties have made it impossible for them to digest a large amount of literature on this subject. Some illustrations have been introduced which are excellent. They give credit to all the standard books which deal more or less directly with this important subject as having been aids to them in the preparation of their text.

The various chapters, which number twelve, begin with a discussion of the Virulence of Organisms and the General Conditions of Infection and Resistance, with the Phenomena of Immunity, followed by a Consideration of Toxins and Antitoxins. There are chapters upon Agglutinins and Precipitins, Cytolysins, Cellular Resistance, Complement Fixation, Hypersusceptibility to Infections and Anaphylaxis, and Defensive Ferments.

Curiously enough they have placed in an appendix the important subjects of the Therapeutic Employment of Blood Serum, Prophylactic Vaccination, and of Vaccine Therapy. We are glad to note that they emphasize the clear differentiation which must be made between prophylactic vaccination and therapeutic vaccines. There can be little doubt that the use of so-called vaccination for prophylaxis is infinitely more important than for treatment, and this particularly holds true in regard to acute infection, in which we need the aid of vaccines more than in any other condition met with in practice, but in which they usually fail.

We wish that the authors had devoted

more space than they have to this practical application of the ground which they have covered. They have undoubtedly succeeded in their effort to present us with a laudable summary of a subject which is constantly growing in importance.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Vol. I, March, 1921. Edited by H. A. Hare, M.D., assisted by Leighton F. Appleman, M.D. Lea & Febiger, Philadelphia, 1921.

The March issue of *Progressive Medicine* contains articles upon the Surgery of the Head, Neck and Breast; of the Thorax; Infectious Diseases; the Diseases of Children; Rhinology, Laryngology and Otology.

These articles are contributed by Dr. George M. Coates, Dr. Charles H. Frazier, Dr. Stafford McLean, Dr. George P. Müller, and Dr. John Ruhräh, all of whom are well recognized authorities in their departments. They give an adequate summarization or story of the literature in these branches of medicine during the past twelve months. Weeding out from the literature those articles which they deem of little value, they combine, in what they have written, the sum and substance of all valuable contributions, thus presenting to the busy practitioner, as we have said before, an interesting story of practical value.

GYNECOLOGY. By Brooke M. Anspach, M.D. Copiously illustrated in black and in colors. The J. B. Lippincott Company, Philadelphia, 1921. Price \$9.

Dr. Anspach, who is the Associate in Gynecology in the University of Pennsylvania, has presented the profession with a volume of 752 pages of text and no less than 526 illustrations. Dr. John G. Clark contributes an introduction to the volume in which he speaks enthusiastically of the work which his assistant has performed. Dr. Anspach's object has been not only to present his subject in such a way that it would prove useful to the man who has already become a skilful gynecologist, but also so that it will enable the young practitioner to learn step by step the fundamentals of his subject and the radical pro-

cedures which he may resort to when he has acquired sufficient skill.

We have seldom seen a book in which the illustrations are so excellently reproduced, and this holds true even of the *x*-ray reproductions, which in many volumes are so obscure as to be practically worthless.

In his foreword, Dr. Clark points out that the author has not only written the book from his own experience, but that he has paid adequate attention to literary references and so produced a well-balanced text.

It must not be thought that Dr. Anspach has confined himself solely to operative procedures. As Clark well says, he has a most instructive chapter on the Hygiene and Proper Care of the Adolescent Girl, a subject which, because of its ultimate influence upon the adult woman, is of far-reaching importance.

Special attention is also paid to the interesting topic of the Endocrine System in its relation to functional aberrations. While recognizing that the subject is still embryonic, Dr. Anspach has presented to the reader all that which may be considered fairly certain and worthy of credence. Careful attention has been given to the value of the *x*-ray in gynecological diagnosis, and also in regard to its employment and that of radium in the treatment of pelvic diseases.

Altogether the book is a credit to American gynecology, and we doubt not will be exceedingly popular with practitioners and students.

RATIONAL TREATMENT OF PULMONARY TUBERCULOSIS. By Charles Sabourin, M.D. Authorized English translation from the sixth revised and enlarged French edition. F. A. Davis Company, Philadelphia, 1921. Price \$3.50.

This book, written by a French physician in charge of one of the large sanitariums devoted to the cure of tuberculosis, covers about 450 pages. It is divided into several parts. The first part discusses in seven chapters the Curability of Tuberculosis. Part II deals with rational treatment of tuberculosis in no less than ten chapters, and Part III with the social hygiene of tuberculosis. Naturally the greatest interest on the part of practitioners will be

taken in Part II, in which the author deals not only with the Open-air Treatment, the Rest Treatment, and Dietetic Treatment, but, equally important, with the question of overfeeding in tuberculosis, which makes up a chapter of its own. Then follow chapters upon medication and auxiliary treatment, with others dealing with the complications of tuberculosis and its treatment in sanitariums, coupled with directions as to the conduct of life of one who may be said to have recovered.

The fact that the book has reached the sixth edition in French indicates that it has proved to be of practical value to medical men.

EYE, NOSE AND THROAT NURSING. By A. Edward Davis, A.M., M.D., and Beaman Douglass, M.D. Second revised edition, illustrated. F. A. Davis Company, Philadelphia, 1920. Price \$2.50.

It is apparent from the title of this book that it is intended for nurses. That it has reached a second edition in the space of five or six years also indicates that it must have proved useful. Like many books which are devoted to the instruction of nurses, we are inclined to think that it goes almost too far along the lines of therapy. It is quite proper for a nurse to be instructed as to how to do things, but it is a question as to how far she should be instructed to do things which because of lack of thorough medical training she cannot be expected to attempt with great skill. There is rather a tendency at the present day for nurses to treat cases themselves rather than to follow with care the directions of the physician. For this reason we look somewhat askance at the inclusion of prescriptions for the treatment of the diseases under consideration in this volume. On the other hand in bringing together its text it is evident that the authors should be not only thoroughly familiar with their subject, but also that they should have a clear idea of what a nurse needs for the practical carrying out of her work.

The book is well printed and should be looked over and studied by those who have control of the training of nurses before they decide that any other will be better than this for the use of their pupils.

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Original Articles

Posture a Cause and a Remedy in Enteroptosis

BY WILLIAM GILBERT ANDERSON, M.Sc., M.D., DR.P.H.

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I sometimes wonder if it is worth while presenting arguments favorable to voluntary neuromuscular training to our readers because of the general lack of interest, or at least moving interest, in the subject. It is quite safe to say that eight out of every ten persons claim they have no time for such forms of physical activity, and that their faith in the efficacy of this work is in corresponding ratio to their belief. However, if the remaining two are willing to improve their efficiency, then I am glad to write a short article on the possibility of restoring certain bodily organs to almost their pristine virtue as working machines.

The word ptosis has become so well known that it is like a bird leaving its nest, for it has departed from the medical confines and is used understandingly by the layman.

Of the four forms of ptosis, the skeletal, visceral, circulatory, and emotional, I will attend to only that form known as enteroptosis, which, for the benefit of the non-medical man who may read these lines, means the falling or displacement of any or all of the vegetative organs; and while visceroptosis and splanchnoptosis may be preferred, we at least understand that the condition is a sagging of the abdominal organs to such an extent that their normal functioning is no longer of 100 per cent value, and, as the body depends upon energy for its efficiency and any displacement

detracts from the working value of the machinery which turns food into energy, we may admit without further discussion that if ptoses exist there will be a lessening of the amount of energy stored or used as there would be in the case of any mechanical contrivance that was neglected.

Of the several factors which cause enteroptosis, namely, posture, lack of exercise, too abundant deposit of fat, unhygienic dress, and other predisposing pathological conditions, I will write of posture and exercise as agents of worth in preventing or remedying these displacements.

Incidentally I want to refer to what may seem irrelevant topics, because I wish to call attention to unfortunate existing conditions which militate against a more widely spread and more acceptable gospel of health.

If the lack of exercise is the cause, then exercise is indicated, but unfortunately people will not exercise; they will not go to gymnasia, they fail to join institutions where physical training may be had, and they will not continue the exercises at home; so we will try another plan.

If posture is the cause, then posture may be adopted as a remedy, and as this is a form of physical training that can be easily done at home or on the streets, we will amplify the value of personal bearing, of proper carriage.

The questions of diet, rest, play, relaxation, will for the present be omitted, but at

any rate we must remove the cause, whatever it may be, before attempting to build up the ruins.

Good posture or position, and this includes the replacing of the bodily organs, is of such vital worth that I am going to refer to the findings of a few others who have made a careful study of the subject.

Goldthwaite refers to the results of investigations made by Scholder and Weith in Lausanne, which showed that, among 1254 schoolchildren, in over 20 per cent albuminuria could be obtained by putting the children in certain definite postures.

Jones has shown that the vertical posture is better for action and the discrimination of pitch, the horizontal better for memory and adding.

He studied the reports that came to him from 350 distinguished men, and of this number 65 per cent reported that their position for writing or doing their best thinking was either horizontal or semi-horizontal. One well-known writer did his best work when lying flat, face down.

When studying conditions among college men he found that out of 81 men 35 preferred the semi-horizontal position or the

use of a Morris chair, or with feet resting on a table.

In referring to Sir Lauder Brunton, he stated that this eminent scholar was unable when seated to think or write after a hard day's work, but if he placed his head on the desk on a level with the paper he was able to collect his thoughts and the ideas came faster than he could pen them. If he raised his head he was utterly incapable of carrying on the work. In other words, if the blood would not go to the cerebrum he would take the brain down to the blood.

Dr. W. H. Burnham of Clark University says: "Good posture represents one of the habits of prime significance. This is emphasized, first, by the fact that such posture tends to preserve the individual from many physical disorders; second, many ordinary reflexes are connected with posture which conduce to poise, dignity, self-reliance, and efficient and healthful work; and third, because the study of conditioned reflexes suggests that in subtle and unimagined but significant ways conditioned reflexes of the utmost significance to physical and mental health may be developed in connection with posture."

FIG. 1.—Effects of tight lacing.

FIG. 2.—Man who had worn a belt.

FIG. 3.—Side profile of a healthy man.

FIG. 4.—A man improved by training.

PLATE No. 1.

(Kellogg.)

Dr. C. Ward Crampton in his paper entitled "Good Posture" gives well illustrated exercises which are highly recommended.

Thirty years ago Dr. J. H. Kellogg of Battle Creek, Mich., read a paper on the "Physical Decadence of American Women." His views received the hearty indorsement of Professor Meinert of Dresden. The cuts clearly showed the displacement of the abdominal viscera. He recommended certain exercises in addition to postural improvement.

Those wishing to pay more attention to the subject than I will here are referred to the findings of Glenard in 1881 in France, of Keith, the English investigator, in 1903, to Goldthwaite's writings in 1910, and to the discussion by Dr. J. H. Kellogg as far back as 1893, when he made plain by his paper how much the working value of the abdominal viscera was reduced by these conditions. The Roentgen rays have further proven to what extent the organs mentioned have departed from the positions which for years were so artistically shown in our standard text-books. These unhygienic conditions exist, and they are productive of harm greater than is usually credited to them.

Is it not a sad commentary that to-day there is not in this country a single large isolated gymnasium devoted to physical education? I am not referring to those found in our Y. M. C. A.'s and Y. W. C. A.'s, in colleges, secondary schools, or like institutions, but to a well-regulated edifice devoted entirely to the rational physical uplift of the human body. Such a center, under the supervision of medical men, having the sympathy of the medical profession, offering careful and scientific examinations, medical, orthopedic, and anthropometric, and with a teaching force well trained and competent. There are reputable institutions which will give careful somatic tests, but what I refer to is a health center to which any one may go for treatment as well as a diagnosis.

Again, I know of no school in this country where bodily training of the most comprehensive, complete, and scientific kind is first and foremost, and where the

development of the mind has a secondary place.

The wealthy man who will start such a school for boys or girls and stick to it will be doing a great good to very many who need a sound basis for psychic activity.

I hope these ideas will fall on fertile soil, and that in the not too dim future some one may endow a school of this kind. We know only too well that many young men with brilliant minds have fallen by the way-side because of the frail bodies.

The main object of this paper is to describe one posture that will go far toward remedying the abdominal ptoses mentioned, which can be taken by young or old, either sex, will cost nothing, and does not require one to go to a gymnasium.

It may seem strange that the first appliance is a good looking-glass; this will be found in most homes, and if it is not there I hope one will be secured, for it is before the mirror that we want our patient to stand and honestly study his body. He cannot but be unfavorably impressed with the unsightly appearance, especially with the sagging abdomen, the flat chest, the round shoulders, the drooping head, and the growing curves of a spine that like the camel groans under the increasing load. It may be that the esthetic sense is not aroused, but surely the person who suffers or pays the price of carelessness or ignorance would like to be freed from the aches, pains, and inefficiencies which follow the enteroptosis trail.

How many of my readers can honestly say that they do not even know that they have a stomach or liver or spleen or pancreas because they function so normally? How many can, week after week, pity their neighbors who resort daily or nightly to laxatives, because they themselves know not what it is to be irregular in eliminating the ashes of the body? I fear very few, and, what is more, the number who do depend upon aperients is growing, not lessening.

Our lady who studies her body honestly before the mirror will become disgusted

with the reflection, but she can hide the defects with the help of her corsétière, and if other portions of her anatomy need camouflaging there is the corner drug store where certain toilet articles will help. But do these contrivances cure or even remedy? Why won't this woman take just a little of the time required to make her facial, skin or hair toilet and assume a good standing position? Because she does not believe in such procedure or because the results come too slowly.

What does our man do when he finds the chest taking the place of the abdomen? Too often resorts to a "vitality belt"; but the fat remains, only it is pushed farther up against the heart and lungs, and he knows he has difficulty in breathing. He will take pills, but he won't exercise, and so the ever-increasing pressure of the adipose deposits against the walls of the waist line cause a bulging and sagging that is at once unsightly and unhealthy.

The accumulation of weight, due to this deposit of fat and weakening muscles,

causes the organs to "slip from their shelves" and fall, and thus to become incapacitated for their best work.

Fat seems to go over the lines of least resistance, and we find it generously deposited on the muscles of the abdomen and around the organs of this cavity. If it finds a resting-place at the uttermost parts of the body it may be more easily removed by certain exercises combined with careful eating, but when one tries to get rid of the fat that has made a home for itself around the great omentum, which seems to have an affinity for such substance, it is the task of Hercules to get rid of it, but it can be done.

In carrying out some research work in which I was interested I raised my weight from 135 to 155 pounds, then later ran it up to 175 pounds, and was for the first time in my life ready to look with favor upon self-destruction on account of the suffering caused by the fat. There was of course ptosis, with accompanying unrest. Continuing, I reduced to 148 pounds, and

then was certain that only the grave held peace and rest for me; now back at 160 pounds the sun shines in my life, but the main fight has been with the reduction of fat in the abdominal cavity.

May I sound this warning? Do not put on too much weight, and under no conditions try to reduce too much, for nature demands payment in either case, and her bill will be receipted; there is no exception.

No attempt will here be made to discuss the diet, and no long list of exercises will be printed, for that would be a waste of time and effort, but I will mention one posture which is most helpful and *must* be taken if enteroptosis is to be remedied. There are also two exercises I will describe, both excellent, but if our corpulent, ptotic patient will not do this much he will find the income tax modest and shrinking alongside the demands of Dame Nature.

Posture No. 1.—Study the details of the half-tone and note the changes that have taken place in the appearance of the powerful youth who stood before the looking glass and involuntarily assumed a more hygienic attitude. He brought into play many groups of muscles (see Exercise No. 2).

Our patient with the sagging abdomen and falling vegetative organs must do this many times daily. At home, on the streets, in the car, at the office, theater, or church, while sitting or standing, and on every occasion. I promise without hesitation that the results will be excellent.

Mantegazza once said that if a person wished to feel like a fool it was only necessary to stand and look like one. May I add that to feel wide-awake and "chipper" it is only necessary to assume and hold an alert, energy-full position?

So far as possible never bend the spine in the thoracic region when the hinge can be put at the pelvis—i.e., in leaning over a table or desk.

Grasp every opportunity to strengthen the spinal machinery.

Arching the chest brings into action the

erector spinæ muscle; at the same time the abdominal contractile tissues are shortened.

Exercise No. 1.—Intended to widen and deepen the thorax, to give greater space for the heart and lungs, to overcome round and stooping shoulders, and to strengthen the abdominal muscles and spine (see Figs. A and B).

With the feet apart sidewise bend the elbows smartly as seen in A, place the finger-tips over the top of the deltoid, elbows back, and the scapula flat against the posterior thorax. Arch the chest to its utmost, draw in the abdominal muscles, and hold the position five seconds.

A.

B.

Next thrust the arms slowly upward as in Fig. B, and at the same time bend the body backward slightly, and look up. Hold this position five seconds.

Next return to position A and hold for five seconds; then lower the arms to the side and relax, but do not assume an unhygienic attitude. While in the relaxed state breathe deeply.

This exercise has taken only twenty seconds, or one-third of a minute. Take it twice more, and the wonder will grow that it actually tires one. Consider how many groups of large muscles have been brought into action: those on the back of

the leg, on the front of the thigh, the back and sides of the hips, the entire erector spinæ group, those across the shoulder-blades, all the abdominal muscles, and every small one used in raising the ribs.

Holding a position five or ten seconds causes both destruction and accretion in the tissues, or chemical changes, which are desirable in securing growth and development. The deep breathing aerates the blood.



Outline diagram of quadruped, axis of spine at right angles to vertical dotted line. (Goodsir.)

Now it will be necessary to quicken the action of the heart and lungs, and this is done by the following:

Exercise No. 2.—To quicken the action of the heart and lungs. With the hands on the hips, fingers forward, feet apart, rise on tiptoes, then half bend the knees, lowering the body; next extend the knees, and lastly lower the heels. This takes at first two seconds, but should be done in one second. Take it five times. It will be



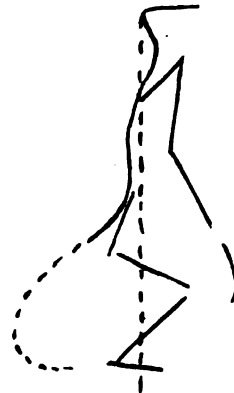
Outline diagram of bird. Axis of spine lies obliquely to vertical dotted line. (Goodsir.)

found that the pulse-rate will jump from seventy-five to ninety or even more, depending upon how much active leg work our subject is in the habit of doing in his daily life.

It is not essential that the rate be advanced to one hundred and twenty or more, because what we are striving for is the change which will take place when there is a rational balance between the constructive and destructive metamorphosis of tissues.

Before closing let me suggest that *rapid* walking is a splendid exercise for the adult. Increasing the speed when going up-stairs greatly quickens the heart action. Sauntering or strolling along the streets is not a good exercise; it is a highly reflex act, hence economical and conserves energy.

Another suggestion that is worth while: When in your office lean against your desk and gently bend the body backward and



Outline diagram of monkey. Axis of spine lies obliquely to vertical dotted line.

forward. This brings smartly into action the abdominal muscles, which, in enteroptosis, are daily losing their resistive strength.

The whole matter may be summed up in these words: "It has taken months or years for the changes to insidiously come and for the enteroptosis to interfere with the production of energy, so it will take time to remedy; but what I most want is the formation of a *habit* of standing well and almost continuously bringing into action the waist line and spinal muscles.

It may occur to the reader that we are placing great stress upon the spinal column, and we are, for figuratively and literally we want men and women with "backbone" of the best quality.

It is interesting to know that of all animals man is the only one whose spinal axis is vertical, and that being the case man's best work is done when the vertebral column is kept in its normal state.

If we change these lines he becomes to a greater or less degree incapacitated for high-grade work. It is just as true if we modify the obliquity of the spinal column of animals; a dog on two feet is useless, the ape when straightened out like a man apparently suffers, while the bird maintains the angle as seen in the accompanying outlines from Goodsir.

Regarding the verticalness of the human spine Turner says: "But man possesses certain special or distinctive anatomical characters. The most noticeable, as seen on an external examination of his body, is his erect position. He is, indeed, the only living creature that can walk or stand erect

—i.e., with the axis of the spine vertical; with the hip and knee joints capable of being fully extended, so that the leg is brought into line with the thigh."

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A Brief Review of Modern Methods in the Diagnosis of Renal Disorders¹

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Prefatory Comment.—There can be but few, if any, engaged in the active practice of medicine who are unaware that a new and important chapter has been added to our knowledge of renal disease and renal deficiencies. During the past ten years medical literature has presented an ever-increasing number of contributions containing the record of many studies and advances. At the present time the study of a patient suspected to be the subject of renal disease involves, for the most part, the use of methods of comparatively recent development. The general conception of renal disease has veered from an anatomical to a functional basis. Until comparatively re-

cently, for want of a better plan of classification, the clinical endeavor was to group forms of renal disease into several anatomical types, according to post-mortem findings. The older classification of Bright's disease recognized acute and chronic nephritis. The chronic form was subdivided into parenchymatous (large white kidney or later small white kidney) and interstitial (contracted or granular kidney), according as the changes in the former type chiefly affected the glomeruli and tubules, or were largely confined to the blood-vessels and connective tissues in the latter.

The clinical investigation consisted in ordinary urinary examinations, often yielding findings interpreted as indicating renal disease when none existed, or, perhaps,

¹Read before the Philadelphia County Medical Society.

quite as often failed to reveal such disease when present and well advanced. Toxic symptoms, edema, arterial sclerosis and hypertension, anemia, and cardiac hypertrophy were associated findings upon which considerable diagnostic dependence was placed. In the chronic forms only well-advanced cases were recognized, and most of them were beyond amelioration and were short-lived. The diagnosis of Bright's disease was equivalent to a death warrant calling for early execution; it still carries with it in the minds of the laity, and even in professional estimation, a significance of sinister import. The treatment had no rational basis. There was much confusion, uncertainty, and error. Clinicians had become accustomed to the jibe of the pathologist that they were likely either entirely to overlook a renal affection, or fail to determine antemortem its anatomical variety; the obvious retort was a challenge to the pathologist accurately to describe the urine which a kidney examined post mortem had secreted before death, or the symptoms which it had produced. Manifestly, an anatomical conception of renal affections based upon end results as seen in the post-mortem room, and even then often impossible of classification or correlation with clinical findings, could have only a limited value in diagnosis, prognosis, and treatment. The more recent tendency to develop a functional estimate has made for earlier recognition, and given more confidence and exactitude to both diagnosis and treatment.

Another important result of the re-awakened interest has been to give an impetus to the study of renal physiology. Many new facts of value concerning the functional activity of the various histological elements entering into the kidney structure have been revealed, although much still remains to be learned.

The importance of a functional conception of renal disease becomes apparent when it is realized that anatomical lesions are incorrigible; a rational plan of treatment by a regulation of the diet is one in which the demand made upon the kidney is lessened to within its decreased functional

capacity. Unless the nature and degree of functional impairment are ascertained, we have no definite basis upon which to base either prognosis or treatment. Diagnosis includes the recognition of both the nature and degree of a disorder. Anatomical lesions have an importance in proportion to the functional impairment which they occasion.

The present communication is an attempt to present an outline of the modern methods of investigating renal disorders.

Important Fundamental Considerations Regarding Renal Function and the Evidences of Renal Deficiency.—An accurate appreciation of certain fundamental facts bearing upon renal function and the results of renal failure is a prerequisite to an appraisal of the value of ordinary clinical findings and special tests. A statement of renal function, set forth in simplest terms, would present the kidneys as the chief excretory organs upon which falls the burden of maintaining the molecular concentration of the blood at fixed points by the elimination of water containing sodium chloride and other salts, urea, uric acid, creatinine, and other nitrogenous substances, and certain other less important products. Normal kidneys are capable of exercising a functional capacity several times greater than is necessitated by the demands made upon them under ordinary circumstances. Their accommodation limits enable them to meet, without overstrain, unusual, exceptional and variable conditions, in which waste products, in varying amounts, gain access to the blood; despite the constantly changing burden of waste products, the composition content percentages remain fixed, or vary only within narrow limits.

One important evidence of renal failure is a loss of reserve power, a widening of retention limits, and the accumulation of waste products in the blood above normal percentages. The failure will first occur only as the result of some unusual demand, but as the lesions are progressive in their development the dependent functional failure will ultimately become constant, the

degree of the failure varying according to the demand and the extent of the lesions.

The symptoms of marked renal failure are wide-spread in their distribution, and affect several physiological systems. The various estimates and tests of renal functional capacity depend upon a determination of the composition of the blood, the measurement of kidney elimination under known conditions, and their response to certain tests designed to determine their ability to meet a measured demand, the average response in health being known and used as a norm.

Several preliminary points with regard to the ordinary chemical and microscopical examination of the urine should be emphasized. Urinalysis is not a means of measuring kidney function. Numerous casts and much albumin may be present with almost normal capacity; both may be absent with great impairment. Fifty thousand healthy soldiers studied by MacLean showed morning albuminuria in 6 per cent. Orthostatic albuminuria in childhood is often severe without anatomical lesions or permanent functional impairment. Positive urinary findings constitute an indication for a more thorough and painstaking investigation of renal function. Negative or slight findings are not to be relied upon as excluding considerable renal damage.

Estimation of Renal Failure by Blood Analysis.—Our knowledge of the chemistry of the blood in renal disorders is of recent development. While much remains obscure, a great deal of light has been thrown upon the subject of nitrogen retention. The practical value of this work lies in a more exact knowledge of the percentage concentration of the non-protein nitrogen of the blood in both health and disease. The fact of retention of these substances beyond normal amounts means, of course, a defect of excretion—i.e., their concentration in the blood is caused by an eliminative failure of the kidneys. The correlation of the two facts is obvious.

Referring to non-protein, the consensus of the best opinion at present establishes the following values as upper normal limits

for blood constituents per 100 cubic centimeters of blood: Total non-protein nitrogen, 35 to 40 mg.; urea nitrogen about 50 per cent of the total, the absolute amount being from 10 to 20 mg.; creatinine 1.0 to 1.5 mg. Creatin nitrogen, amino nitrogen, and ammonia nitrogen are present in small amounts. Normal sugar concentration has been fixed at 0.1 to 0.15 per cent. The foregoing figures are used as controls in interpreting blood findings in abnormal cases. With impairment of renal function and consequent blood retention, the total non-protein nitrogen may reach 100 or 200 mg., or more, per 100 Cc. of blood. Blood urea is chiefly responsible for the increase (azotemia), the urea nitrogen often amounting to 70 to 90 per cent of the total. Passive congestion of the kidneys, or a diet rich in proteins, may produce an increased nitrogen concentration in the blood, but the total will not exceed 45 mg.

Uric acid occasions the greatest difficulty in elimination; creatinine, the least; urea occupies an intermediate place. Uric acid concentration is an early evidence of renal failure; creatinine concentration occurs only as a late manifestation, and is an evidence of advanced disease. A value exceeding 5 mg. per 100 Cc. of blood has usually terminated fatally; it may reach 15 to 20 mg.

A marked increase in the total non-protein nitrogen may be a herald of uremia, although uremia may occur with a low retention, indicating that some other element is the essential factor in its production.

In the interpretation of the results of chemical analysis of the blood in renal disease, it should be emphasized that an ultimate diagnosis of renal damage is not to be attained by this means alone. It is a fact of pathological importance that the lesions of nephritis in many cases are patchy and uneven in their distribution. The kidneys may suffer a certain amount of damage and yet be capable of normal function under ordinary circumstances, the impairment be one of reserve power, and marked failure occur only under unusual stress. H. MacLean's conclusion that, on

an average, the essential structure of kidney may be reduced by three-fourths of its total before nitrogen retention occurs is of interest. Richard's observations on the kidney of the living frog, showing activity of one group of glomeruli with inactivity of other groups, also indicate a very considerable latent unused reserve power. The vicarious function of other organs may be a factor in preventing nitrogen concentration with failing kidneys. The skin, liver, stomach, intestines, and even the bronchial tubes, may excrete urea, and perhaps other nitrogenous substances as well. A patient with severe nephritis and oliguria, observed by one of us, expectorated a daily average of 1500 Cc. of sputum containing over 2 per cent of urea. With an increase in urine the amount of sputum and the percentage of urea rapidly diminished. Another patient with nitrogen retention of moderate degree showed two per cent of urea in vomited material. The diarrhea of uremia is probably often due to vicarious urea elimination. Urea frost upon the skin is frequently observed. In acute nephritis of severe degree and rapid development, nitrogen retention of high grade quickly develops. In chronic forms, increased activity of unaffected regions, and the assumption of vicarious function by other organs, tend to postpone the evidences of renal deficiency for considerable periods of time.

Another factor which may be of considerable importance is the probable diuretic effect of the increased urea content of the blood, stimulating the kidneys to increased function so that the output and urine content may be normal for a time. F. C. MacLean believes that a blood concentration of 20 to 40 mg. of urea acts as a stimulus to renal function; the increased blood concentration of renal disease, therefore, serves to establish a nitrogen equilibrium.

The output of urea also depends, in part, upon the amount of urine excreted. Ambard demonstrated the normal maximal concentration of urea in the urine to be 55 gm. per liter. A total excretion of 100 Cc. of urine per diem, therefore, would per-

mit of a total urea elimination of not exceeding 5.5 gm. Under such circumstances, if a normal amount of urea has been formed, blood retention must necessarily occur. In Asiatic cholera with oliguria, high nitrogen values are constantly present in the blood. The same is true in acute nephritis with low urinary output. Marked decrease in the amount of urine from any cause will result in increased blood concentration of nitrogen.

It may further be added to what has already been presented regarding the general effects of blood retention of nitrogenous bodies that the condition does not satisfactorily explain all of the systemic and local effects associated with such concentration. We are, perhaps, too prone to look upon diseased kidneys as a clinical entity, rather than to regard the results as a metabolic insult to the entire organism. Retinitis is often an associated condition, but has not been demonstrated to be due to nitrogenous bodies. Scholl and Foulds report the case of a patient with anuria in whom the blood urea reached 528 mg. per 100 Cc. of blood; there were no evidences of toxemia and little disturbance of any kind. The same absence of symptoms has been noted in bichloride poisoning, and after the removal of a single kidney with anuria. The intravenous injection of large amounts of urea produces little systemic reaction. The toxic base of undetermined chemical formula isolated by Foster, and found to be present in many cases of uremia, more convincingly explains the phenomena of that condition than does nitrogen retention.

Functional Tests of Renal Capacity.—Many attempts to devise a satisfactory test of renal function have been made during a considerable number of years. It is only comparatively recently, however, that functional tests have been so simplified and extended that they can be used with ease and accuracy by any practitioner. Many important aspects of kidney activity are revealed by the simplest tests requiring only careful observation and intelligent interpretation. The normal kidney excretes urine

which varies in concentration at different times in the twenty-four-hour period. There is a reaction to both food and fluid stimuli, so that the molecular concentration of the blood remains within fixed normal limits. The rapid removal of a large amount of solids from the blood following a meal will raise the urinary specific gravity unless the urine is proportionately increased in amount; the removal of a large amount of fluid from the blood will lower the urinary specific gravity unless there be a corresponding elimination of solids. The kidneys show considerable flexibility in their ability to meet these varied demands, and this flexibility may be measured with some degree of accuracy in various ways.

A careful determination of the specific gravity and quantity of both day and night urine yields important data. A knowledge of these two factors makes possible an estimate of the total amount of solids excreted. The amount of urea excreted can easily be determined by the use of the ureometer. From the urea the amount of nitrogen eliminated can be calculated. Fifteen grammes of urea contain 7 grammes of nitrogen.

Another simple test of renal excretion is afforded by the administration of a measured amount of water and the determination of the amount eliminated in a given length of time. If less than the normal amount is excreted, renal disease and diminished function are suggested.

Two other simple tests may be used to reveal functional impairment occasioned by contracted kidneys. The first stage is shown by a loss of power to concentrate the urine. A healthy individual placed on a very dry diet for twenty-four hours will show a rise of urinary specific gravity to 1030 or 1040. In contracted kidney, a patient placed on a dry diet may excrete a urine having a specific gravity not exceeding 1011 to 1013. In other words, the kidneys show an inability to concentrate the urine, the so-called first stage of fixation of the specific gravity. The second stage consists of a loss of power to dilute the urine. Normally, the ingestion of a large amount

of water will result in a reduction in the specific gravity of the urine to 1003 to 1005. If this power to dilute the urine is lost, it constitutes evidence of a more advanced stage of disease. Fixation of the specific gravity under both tests shows that the kidneys have lost the power either to concentrate or dilute the urine.

A more elaborate test may be made by collecting the urine systematically during the day at the end of each two-hour interval, beginning at 8 A.M., and ending at 8 P.M. The night urine during the succeeding twelve hours should also be collected separately. The amount and specific gravity of the urine of each two-hour and the night periods should be measured and the specific gravity determined. A night urine equaling in amount the day urine suggests contracted kidneys. Fixation of the specific gravity throughout the twenty-four hours is confirmatory. Nocturnal polyuria is one of the earliest symptoms of contracted kidneys. The ratio exhibited between the amount of night and day urine in health is from 1:4 to 1:2; in disease the amounts are about equal, the kidneys having lost the ability to concentrate.

Mosenthal has devised a more careful test in which a measured diet is administered, and more accurate deductions as to kidney excretion can be made. The diet, to which the patient is carefully restricted, contains approximately 13.4 grammes of nitrogen, 8.5 grammes of salt, 1.760 Cc. of fluid, and a considerable quantity of purin material in the meat, soup, tea and coffee which are included. The urine is collected at the end of each of the six two-hour periods during the day, beginning at 8 A.M., and during the night.

Normal individuals will present the three following urinary characteristics:

The specific gravity of the different specimens will show variations, usually of nine or more points. The daily intake and output of salt, nitrogen, and fluid will be approximately equal. The night urine will be high in specific gravity (1016 to 1018 or higher), the percentage of nitrogen high (above 1 per cent), and the total quan-

tity of urine small (750 Cc., or less), the latter regardless of the quantity of urine passed during the day.

Impairment of the kidney function is indicated by the following findings:

Nocturnal polyuria (over 750 Cc.).

A tendency to polyuria throughout the entire period, the volume of urine equaling or surpassing the amount of liquids ingested.

Fixation of the specific gravity within narrow limits; in advanced stages the maximum variation may not exceed 1 or 2 degrees.

Fixation in the two-hourly quantity of urine eliminated. The diuretic influence of food ingestion is absent.

If the night urine diminishes to within normal amounts, it will show a low nitrogen content and low specific gravity.

There may be a marked retention of both salt and nitrogen.

The urea test, as described by Edward Weiss after MacLean and DeWesselow, consists in the administration of 15 grammes of urea in 100 Cc. of water flavored with tincture of orange. The stomach and bladder should both be empty. The urine is collected one hour and two hours later. If either specimen exceeds 150 Cc. in amount, a third-hour specimen is collected and examined; otherwise the urea percentage content of the second-hour specimen is taken. A urea percentage of 2 per cent in the excreted urine indicates normal function. In disease of the kidney it may fall to 0.5 per cent.

The phenolsulphonephthalein test is one of the simplest and probably the best and most reliable test for kidney excretion. It can be made by any practitioner. Convenient ampoules containing slightly more than the required amount of the solution of 6 mg. of the dye to each 1 Cc. of fluid may be kept at hand. The bladder should be emptied, at least 500 Cc. of water taken, and exactly 1 Cc. of the solution administered hypodermically. At the end of one

hour and ten minutes, and again at the end of two hours and ten minutes, the urine is voided and separately saved. The amount of dye in each portion of urine is easily estimated by means of a colorimeter, or by comparison with standard solutions of known strength. The normal excretion varies from 40 to 60 per cent in the first hour, and 20 to 25 per cent in the second hour. Diminished excretion is shown in disease. The test is useful in estimating both the degree of damage and the progress of a case, either as to improvement or further impairment.

Conclusion. — The conclusion of this paper is a plea for a more general recognition of the importance of a functional conception of renal disease, and a more frequent utilization of the more exact methods of determining both the presence and the degree of impairment of renal function. Too much reliance has been placed upon ordinary urinalysis, and much error and uncertainty occasioned thereby. No group of serious affections has been more perfunctorily regarded, or the subject of more mistakes. Many of these errors will be avoided if practitioners of medicine will familiarize themselves with one or more of the simplest tests, and apply them with intelligent understanding.¹

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¹ Another article dealing with a cognate topic more in detail will appear by these authors in the next issue.—Ed.

Non-operative and Postoperative Treatment of Cancer¹

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Judging from the other titles in this symposium, I take it that I am called upon to discuss this subject from the standpoint of treatment by other methods than surgical excision, with the consideration of postoperative treatment by means of the x -ray or radium. On account of the breadth of this subject I will have to be excused for any dogmatic statements that I may make, for I am sure that it is desired by all that the discussion be as brief and as pointed as possible.

SKIN CANCER.

The *basal cell epitheliomata* can all be cured by thorough and skilful applications of either x -ray or radium, and it is the consensus of opinion that generally it is best to treat these patients with massive doses sufficient to destroy all of the cancer cells at once. Massive-dose treatment requires more skill than fractional doses, but I am sure that it is more certain to produce permanent results. Treatment by either the x -ray or radium (and radium is probably preferable) will produce the least scarring, and in many instances the lesion can be made to disappear with no scar whatever. When there is no objection to a soft pink scar I commonly destroy the lesion by electrocoagulation at the very outset and follow this with x -ray treatment. This I believe produces the quickest results, but it is a mistake for any one to attempt to destroy any epithelioma by a fractional process. It is especially important that we use radiation in the treatment of the epitheliomata occurring about the eyelids, for scars in this region are apt to cause contraction and to give rise to ectropion and disfigurement, and therefore either operative removal or destruction by electrical methods is generally inadvisable.

The *squamous cell epitheliomata* are more resistant to all forms of treatment, recur after excision or incomplete destruction, and give rise to metastasis, and it is therefore especially important that this group be treated very thoroughly at the outset by radiation or electrical destruction. I believe that all cancers of the skin, if treated early and thoroughly, can be gotten well. Where these epitheliomata are excised they should be followed by x -ray treatment.

CANCER OF THE MUCOUS MEMBRANE.

Epithelioma of the lip I believe is best treated by thorough radiations alone, or by local destruction with electrocoagulation followed by thorough radiation with the x -rays. By this process, so far as I know, I have not yet failed in a single instance to cure all primary epitheliomata of the lip. I believe that no one has yet been able to report 100 per cent of cures by any excision, no matter how extensive. In all these cases the neighboring lymphatics must be thoroughly treated by radiation. If surgical excision is undertaken these patients should receive thorough postoperative treatment as soon after the operation as the patient can get the x -ray treatment.

In those cases in which there has been so much destruction of the lower lip by the disease as to make electrocoagulation inadvisable, I have obtained best results by the application of radium, and if this is carefully done one can usually preserve the remaining portion of the lip. In these advanced cases one usually finds that the patient has already been treated by plasters or partial excision or some form of local destruction which was incomplete; one is then dealing with a failure in treatment, and the prognosis is less satisfactory.

Epitheliomata elsewhere in the mouth should be treated by a combination of

¹ Read in a symposium on cancer before the Northern Medical Association of Philadelphia, March 11, 1921.

radium and x -ray, and at times by local destruction with electrocoagulation, and in many instances excision of the cheek or half of the lower jaw. These cases cannot be easily grouped; generally each case is a law unto itself, and must be considered

will be improved by postoperative x -ray treatment.

CANCER OF THE BREAST.

Theoretically the ideal treatment of cancer of the breast consists of an anteoperative

FIG. 1.—(a) Epithelioma involving the entire lower lip.
November 23, 1920.

FIG. 1.—(b) All evidence of disease has disappeared under radium treatment, with no loss of tissue. Still well March 5, 1921.

FIG. 2.—(a) Epithelioma of the lip, referred by Dr. H. W. Steiwagon, destroyed by electro-coagulation followed by x -ray treatment over the lip, chin, and submaxillary glands. Last treatment given April 7, 1914.

FIG. 2.—(b) Well April 7, 1914. Photograph made January 8, 1915.

from all angles, preferably by both surgeon and roentgenologist in consultation, before anything is done. I believe that in all cases coming to operation the end results

course of x -ray treatment, by which the cancer cells are devitalized or totally destroyed. This treatment, therefore, makes transplantation or extension during the

operation less likely. By anteoperative treatment I mean a preliminary course of treatment which will require usually a week or ten days, and I believe that the patient should then be operated upon immediately. This operation should be complete and just as radical as though no *x*-ray treatment had been given. The patient should then

currence and metastasis, but of course will not eliminate these probabilities entirely. No satisfactory statistics have ever been prepared on this subject, but I believe that the patient's chances of permanent recovery are about doubled as compared with surgical extirpation alone.

Recurrences and metastasis from car-

FIG. 3.—(a) Sarcoma of the neck. Referred by Dr. John B. Deaver, March 26, 1914. Treated by *x*-ray. Last treatment given April 9, 1914.

FIG. 3.—(b) No evidence of disease May 22, 1914.

FIG. 4.—(a) Retrobulbar sarcoma. Referred by Drs. Ross H. Skillern and Maxwell Langdon, June 18, 1917. Treated by *x*-rays. Last treatment given December 15, 1917.

FIG. 4.—(b) No evidence of disease October 18, 1917. Note no damage done to the skin or eye, not even loss of eyebrows or eyelashes. Still well March 30, 1921.

be treated again approximately a month after the first course of *x*-ray treatment, or as soon as it is practical after the operation. When anteoperative treatment cannot be given the postoperative treatment will undoubtedly decrease the chances of re-

cinoma of the breast will generally yield, at least temporarily, to thorough radiation. Each of these cases is a law unto itself, and the form of treatment must be judged according to the indications in the individual case. In some instances much can be ac-

complished by the introduction of radium needles into the metastatic nodules. In other instances the local application of radium over metastatic nodules with general treatment over the larger areas by means of the x -ray will accomplish most. In dealing with metastatic carcinoma, however, one must always be on guard for a recurrence or metastasis elsewhere in the body. For instance, I have treated a patient with a local recurrence covering an area 3 by 4 inches in diameter and firmly adherent to the chest wall which disap-

had been bedfast for fifteen weeks preceding the x -ray treatment, and had total destruction of one of the vertebræ and partial destruction of another. However, I believe that in all cases in which the disease has extended to the spine we must expect, sooner or later, that other portions of the osseous system will become involved.

Primary Carcinoma of the Breast.—In inoperable cases, and in all those in which there is a contraindication to operation, they can be treated by radiation with a reasonable hope of success. I have seen

FIG. 5.—(a) Osteosarcoma of the fibula. Referred by Dr. M. P. Warmuth, March 3, 1906. Section removed was reported as round-cell sarcoma. Treated by the x -rays during three months.

peared completely and with no recurrence locally at any time, but nine years afterwards metastasis was discovered in the spine, and even this has yielded under treatment. I have treated a number of cases of metastatic carcinoma of the spine following amputation of the carcinoma of the breast, and in a number of instances have secured complete healing of the vertebræ. One patient has remained well three years, and is doing all of her housework, including her washing and ironing, yet she

FIG. 5.—(b) Followed with x -ray examinations during six years. Progressive recalcification of the tumor area. Still well September 15, 1919. Probably well to-day.

complete disappearance of the tumor masses of the breast, and even the metastatic nodules, and have patients that have remained well for ten or more years. In these primary cases I have obtained best results by a general application of the x -rays from all angles directed toward the breast, and then in two or three weeks I introduce radium needles in whatever tumor mass remains. I believe this to be the best form of treatment in the primary inoperable cases. All cases of carcinoma of the breast

should have an *x*-ray study of the chest for metastasis, for approximately 50 per cent of the patients as they come to me have metastasis in the chest.

CARCINOMA OF THE UTERUS.

In a number of the German clinics operative procedures for carcinoma of the uterus have been abandoned, and these patients in those clinics are treated by radium and *x*-rays, and, it is claimed, with greater success than has been obtained by operations, with very much less risk to the patient. In some of the American clinics a progressively increasing number of patients are being treated by radiation, and the border-line of operability is rapidly contracting. I am quite sure that in all doubtful cases, and of course in all inoperable cases, more satisfactory results can be obtained by thorough radiation than by any other means. It is surprising at times to see the complete disappearance of great masses of malignant disease in inoperable cases. I am quite sure that in all these pelvic cases the combination of radium internally and thorough radiation by the deepest *x*-rays externally will accomplish the best results. In the operative cases of carcinoma of the uterus I believe that thorough radiation of the pelvis will decrease the liability of recurrence.

In general, a careful consideration of each case by the surgeon or gynecologist, and together with the radiologist, will probably bring about the most satisfactory results for the patient.

Renal Disease from the Medical Standpoint with Particular Reference to Classification and Treatment.

In the *Journal-Lancet* of January 15, 1921, HIRSCHBOECK states that the fundamental element is to provide a diet based on the ability of the kidneys to handle water, salt, and nitrogen, respectively. This summary of the treatment is necessarily brief, and only the salient points are emphasized.

When we remember that practically all

cases of chronic nephritis begin primarily as acute cases, either mild or severe, the thought is immediately forced upon us that very many of these apparently mild acute cases are entirely overlooked. In all acute fevers, particularly of the coccal variety, the urine should be repeatedly examined, and particularly during convalescence must the case be under strict surveillance so that no renal development may be overlooked, and if the urine is not normal, bed rest and proper dieting should be adhered to until these symptoms subside. In acute kidney disease, kidney rest is of prime importance. The diet must be regulated according to the function of the particular case in question. In cases of salt and water retention the fluids must be restricted materially, in order to favor the elimination of the fluid from the hydrophilic tissues. The diet, of course, should also be salt-free. In cases of nitrogen retention or in cases showing frank uremic symptoms, the protein content of the food must be either entirely eliminated or at least reduced to an absolute minimum. Epstein is inclined to think that it is advisable in cases with albuminuria to give a moderate amount of some of the milder proteins, as egg-albumen, on the supposition that this makes up for some of the protein-tissue waste, which disappears in the urine as albumin. This is still a mooted question, however, and clinicians are rather reluctant to generally accept his idea.

Drugs occupy practically no place in the treatment of acute kidney disease, and may do distinct harm, particularly the theocine derivatives. After the acute stage has subsided, iron is of distinct value. Bed rest, absolute, should be insisted on in all cases. If any signs of cardiac insufficiency develop during the course of the acute process, digitalis is the medicine of choice. Diaphoresis and catharsis can be resorted to, and daily sweats are of distinct value, oftentimes considerably accelerated by a preliminary dose of pilocarpine, of from 1/10 to 1/5 of a grain. In severely ill, uremic cases, the pilocarpine oftentimes can be persistently used, and in personal cases

he feels that its use in repeated doses for an hour or two has often been a life-saving measure. In the acute cases, furthermore, venesection is probably of value, as the anemia is not so marked in these cases.

In the subchronic glomerulonephritis, the picture usually associated in our minds as the chronic parenchymatous nephritis, the salt and water retention must be combated by a reduction in the water intake and salt. It is difficult to say what the optimal amount of water is which should be taken by these patients, and no consistent work has been done to establish this point, as emphasized by Christian, but there is probably no evidence contradictory of the fact that the amount should be, at least, considerably reduced. It is questionable whether drugs are of any value. If cardiac complications ensue digitalis again must be used. The diuretics are questionable according to the best authorities. Diuretin, and agents of that kind, if used at all, should be given intermittently and not continually, the best way, probably, being to give it two or three days and then stop for an equal period of time. By restricting the water we usually promote artificial diuresis, due to the elimination of the edematous fluid. Catharsis is also of value in these cases, promoting kidney rest. In cases of this kind, and also in the nephroses accompanied by edema, we often have diuretic crises—that is, the patients for a long period of time do not seem to show any effort at increased elimination of the water and salt, when suddenly things seem to start working, and in twenty-four hours very considerable amounts are passed. Iron is a necessity in these cases on account of the impairment of the blood; bleeding is of no value whatever, and in fact may do serious harm on account of the attendant anemia.

When nitrogen retention occurs the proteids should be eliminated practically entirely. The heart must carefully be guarded in these cases on account of the hypertension, and whenever symptoms of extremely

high blood-pressure occur, rest is very important, even in well compensating cases otherwise. Diaphoresis, diuresis, catharsis, must all be pushed moderately in those cases which are well compensating, and rather vigorously in those that are not compensating well. These cases terminate either by uremia, cardiac defeat, or cerebral hemorrhage. In certain cases, which threaten to die of apoplexy, bed-rest frequently brings the pressures down to reasonable limits. Digitalis must be used in cases in which cardiac failure threatens, and when it has developed the treatment must be directed toward the myocardial insufficiency. The latter cases can usually be recognized by the irregularity or rapidity of the heart action, by the approximation of the systolic and diastolic pressures and by the occurrence of râles in both bases posteriorly in the lungs.

The pushing of water intake in these cases is of doubtful value, and is harmful in the myocardial complications. Miller found recently that by giving the patient enormous amounts of water for several days he was unable to effect any change in the nitrogen concentration in the blood. Austin and Miller also found that even in spite of the apparent benefit derived from diaphoresis no change occurred in the nitrogen retention products. The acidosis in these cases of chronic interstitial nephritis is not due, as in diabetes mellitus, to the formation of acetone and diacetic acid, but to the retention of the products of metabolism. It is in these chronic cases that diuretin sometimes seems to be of distinct value, in some way apparently promoting diuresis and also seeming to have an indirect effect on the blood-pressure and the general symptomatology dependent upon the hypertension. Focal infections in these cases must be removed with reluctance, as they frequently are resultant rather than causative, and their removal may add an increment of toxins overwhelming to the patient.

Editorial

THE USE OF PREPARATIONS OTHER THAN QUININE FOR MALARIAL INFECTION.

It will be recalled that not long after Ehrlich introduced arsphenamine as a remedy for syphilis, he also advised that it should be given intravenously in cases of persistent malarial infection due to poor resistance on the part of the individual, or to the fact that an immune strain of parasites had been developed as the result of the use of small prophylactic doses of quinine. So far as we have observed in the medical literature, this suggestion has not been carried out to the extent that was to be expected, which may mean that not sufficient publicity was given to his suggestion or that it has been tried by a few members of the profession, who, having gotten poor results, have not seen fit to report their failures.

Whatever the explanation may be, we believe that medical men will be interested in a contribution recently made to the *British Medical Journal* by Pratt-Johnson, Gilchrist, and Hay-Michel of the medical corps of the British army. Their investigations were carried out during 1917-1919 on malarial patients invalided from the German East African campaign. Most of the patients were of the severe type, manifesting marked anemia and debility, and suffering from numerous relapses while in the hospital, even when receiving from 25 to 30 grains of quinine daily. Of 8788 cases, 61 per cent had benign tertian parasites in their peripheral blood, 23 per cent malignant subtertian, and 16 per cent both benign and malignant subtertian parasites. The average period in the hospital and convalescent camps was 51 days, during which time the blood was examined at weekly intervals and the patients kept on routine daily quinine treatment. What they call "parasitological relapses" occurred during

this period of observation in 24 per cent of the benign tertian cases, 11 per cent of the malignant subtertian cases, and 39 per cent of the mixed infections. One of the reasons that they assign for the frequency of relapse and resistance to treatment is that the military campaign was a most strenuous one carried out by unacclimated individuals, who, therefore, had their vital resistance materially impaired.

It became evident to them that in addition to using quinine it would be wise, if possible, to get some idea of whether other drugs, comparatively newly introduced into medicine, would prove more efficient. They therefore carried out a series of investigations with neoarsphenamine, arsphenamine, neokharsivan, kharsivan, and galyl. The dose of arsphenamine was usually half the amount commonly given in the treatment of syphilis, namely, 0.3, and in the case of the neo preparations 0.45. Galyl was given in the dose of 0.2. The intravenous injections were made at weekly intervals at first, but subsequently it was found that they could be given on alternate days for three or four injections with safety, and in one case a series of 14 intravenous injections of the above dose of galyl were administered during an inclusive period of 22 days. Altogether they employed several thousands of intravenous injections of these preparations without a single fatality, and they therefore believe that the use of these arsenical compounds does not involve any special risk.

It would appear to us that they must be safer than intravenous injections of quinine, as we doubt whether such injections could be given frequently to so large a number of patients without some accident.

It is interesting to note that certain conditions, or symptoms, induced by the malarial infection were greatly improved by this line of treatment, although theoretically they might be supposed to contraindicate

them, as, for example, tachycardia and cardiac dilatation, which probably were the result of the anemia and toxemia. Thus in 154 cases suffering from these conditions, there was not a moment's anxiety induced by this plan of treatment so far as the heart was concerned. They found that in a series of over 790 injections a pyretic reaction occurred only seven times, but they believe that where there are renal complications the injections should not be given. They did, however, find that vomiting is a fairly frequent symptom of reaction after injection, and therefore believe that severe vomiting, diarrhea, or obstinate constipation should be corrected before an injection is given. All patients should have complete rest in bed for at least twenty-four hours before an injection, given a light diet, and have the bowels opened by a purgative pill, such as the compound pill of colocynth, followed by a saline in the morning. Breakfast on the morning of the injection should consist of one egg, two slices of toast, and a cup of tea, and should precede the medication by at least four hours. No food should be given till four hours after the injection, when tea and toast may be used, and a full meal should not be allowed until the next day. Should albumin or sugar be present in the urine after the patient has rested in bed for twenty-four hours, the treatment should not be carried out.

They did not find that rigors often occurred from injections, but a few cases complained of congestive headache.

The chief advantage obtained by this method of treatment in the opinion of these clinicians has been a great modification in the severity of malarial manifestations, and the production of a distinct tonic effect so that anorexia, lassitude, and debility soon gave way to a feeling of well-being, and shortness of breath disappeared. They also found that splenic enlargement rapidly diminished, and in cases in which enlargement of the liver was marked, with jaundice, rapid improvement usually followed the first injection, although one would have supposed that the state of the liver might have increased the patient's danger rather

than diminished it. Great improvement also occurred in those patients who seemed to be suffering from a dry bronchitis.

Another point which they consider of importance is that these drugs are of considerable diagnostic value in differentiating the benign from malignant forms of infection since the benign forms were almost invariably conquered.

So far as the prevention of relapses is concerned, these preparations give somewhat disappointing results even when they are combined with quinine, and if the case is one of malignant subtertian malaria, quinine must be employed in addition because they believe that these arsenical preparations have little destructive action on these parasites as compared to quinine.

Appended to their paper is a summarization of their views as follows:

1. Neosalvarsan, salvarsan, neokharsivan, kharsivan, galyl, administered intravenously, may be employed with safety in the treatment of all forms of malaria, provided the doses and methods recommended herein and the precautions enumerated are fully observed.

2. These preparations, in the doses recommended, exert a marked parasitocidal action on the benign tertian parasite, thick blood smears, showing numerous parasites, usually becoming negative within twenty-four to thirty-six hours.

3. These preparations have no definite parasitocidal action on any stage of the malignant subtertian parasite. When used in addition to quinine, the action of the latter is intensified and the progress toward recovery is much more rapid.

4. Generally speaking, the tonic effect of these preparations is well marked in all cases of malaria; anorexia, lassitude, and debility soon give way to a feeling of well-being, while tachycardia and shortness of breath, consequent upon anemia and cardiac dilatation, rapidly improve. Splenic enlargements disappear with remarkable rapidity.

5. The employment of these preparations is recommended, in addition to quinine treatment, in chronic resistant infections

and malarial cachexia. Three or four injections at weekly intervals are recommended. Freedom from relapses cannot be promised even after numerous intravenous injections. In regard to the preparation of the solutions and technique of administration, the usual methods are followed in each case.

6. Soamin exhibits no parasitidal action on the parasites of either benign tertian or malignant subtertian malaria. Its beneficial action is confined to the breaking down of the resistance of chronic infections to quinine.

7. Tartar emetic has no demonstrable effect on the sexual or asexual forms of the parasites of either benign tertian or malignant subtertian malaria, and exerts no influence on the clinical course of the disease. The most rapid and certain method of eradicating crescents from the finger blood is adequate quinine treatment (30 grains daily) and arsenic.

8. Inunctions of mercury and antimony ointment do not appear to exert any therapeutic action in malaria.

RATIONAL MEASURES IN RENAL DISEASE.

There can be little doubt that chronic disease of the kidneys has, up until recent times at least, presented a problem to clinicians, both from the standpoint of diagnosis and treatment, which has been a difficult one to solve. Not so long ago practically every physician believed that the presence of chronic nephritis, and, for that matter, acute nephritis as well, definitely and positively indicated that the patient should receive little or no albuminous food, but nearly thirty years ago the writer of this editorial pointed out that there must be a fallacy underlying this rigorous method of treatment, at least in some cases, and that where the albuminuria was very profuse it might well be that the great loss of albumin through the kidney should be compensated for by seeing to it

that the patient had a protein diet which, while not excessive, might at least tend to make up for the loss.

Our lack of knowledge of the problems involved has resulted in the use of many drugs in these conditions, and Basham's mixture has been administered until thousands of gallons have been dispensed with the hope that it might do some good.

The discovery that in many cases of nephritis, particularly if dropsy is present, there is a failure on the part of the kidneys to eliminate salts, caused many practitioners to try a salt-free diet in all cases of chronic nephritis just as they had hitherto employed a non-protein diet in all such instances, but it has become increasingly evident that in many patients there is no need of restricting the salt intake.

We think it can be truthfully stated that within the last five or ten years our conception of what might be called the pathological physiology of the kidney has been very materially increased. We do not believe that every case of chronic renal disease should be treated with a rigid dietetic régime on general principles, but only after it has been carefully investigated, and we also believe that in many cases a proper diet is infinitely more important than the administration of drugs. In this respect renal disease may be said to stand second to diabetes in connection with dietetic therapy.

While much work was done before the great war on the continent of Europe and in England in regard to the functional activity of the kidneys in disease, we think that one of the most helpful investigations, so far as the general practitioner is concerned, has been carried out by Mosenthal and those who have followed him.

Heretofore variations in renal output have depended so much upon variations in food intake and exercise that one examination could not well be compared with another. Therefore, Mosenthal wisely used what has been called a nephritic test meal in which the quantities of fluid, salt, and nitrogenous educts were practically definitely known. Indeed, it would appear that

this method discovers renal inadequacy earlier than the various dye tests which have been introduced or the more complicated chemical analysis of the urine or analysis of the blood. In this test diet, which must extend over a period of twenty-four hours at least, there is permitted food which gives an equivalent of about 14 grammes of nitrogen, 8 to 9 grammes of salt, and 1760 Cc. of fluid. As moderate amounts of meats, soup, tea and coffee are in the diet, there is necessarily present a considerable quantity of purin bodies which, as is well known, tend to stimulate the kidneys. It is important that over and above the salt which is permitted, the food of the patient shall not be salted in addition by the cook, but the salt should be doled out to the patient, to be added to his food at each meal in one-third the quantity already named. The patient, of course, is not allowed to take either food or drink except at regular meal-times, nor is any food or liquid to be given during the night or until after the morning voiding of urine. The patient is directed to empty the bladder at 8 o'clock in the morning and at two-hour intervals until 8 P.M., measure and keep the samples separate, after which time he is supposed to retain the urine until 8 A.M., when it is given the physician. A sample diet may be as follows:

Breakfast: Boiled oatmeal, 3 ounces, with one or two teaspoonfuls of sugar; milk, one ounce; two slices of bread weighing about one ounce each and a moderate-sized piece of butter; coffee 5 ounces, sweetened with a teaspoonful of sugar, and 8 ounces of milk, some of which may be placed in the coffee. Six to seven ounces of water are also allowed at this meal.

At noon-time a meat soup amounting to six ounces, a piece of beefsteak, 3 ounces, a medium-sized baked or boiled potato, a moderate quantity of green vegetables, two slices of bread with butter as before, a large cup of tea with a teaspoonful of sugar, to which may be added half an ounce of milk; a pudding made of tapioca or rice equal to about 4 ounces, and for drinking purposes 8 ounces of water.

At supper, which is usually given at about five o'clock, 2 eggs and the same quantities of bread, butter, tea, sugar, milk as already named, with a moderate helping of some stewed or fresh fruit, and 10 ounces of water are allowed as a drink, and nothing further is given until after 8 A.M.

If this diet is instituted it will be found that in a healthy man there is a very considerable deviation as to the specific gravity in the two-hour samples, amounting often to nine points or more. The night specimen, however, should average a specific gravity of 1.018 to 1.020. The volume secreted between 8 P.M. and 8 A.M. should not be more than 700 Cc. The total quantity in the twenty-four hours should be from 200 to 400 Cc. less than the amount of fluid ingested because of loss of liquid by the lungs, intestines, and skin. In the presence of disease the day urine ceases to vary in specific gravity over a wide range because the kidney is apparently unable to adjust itself from hour to hour to the demands made upon it, for at certain times it is manifest that the kidneys must be called upon to excrete more fluid and more solids than at others. So, too, the night urine is not limited to the normal of 700 Cc., but is in excess of this amount, the kidney endeavoring by secreting a large amount of water during the night to get rid of solids which have accumulated during the day because its threshold has been high. In the chronic contracted kidney therefore large quantities of urine are secreted night and day in the endeavor just referred to, the specific gravity being constant or nearly so both in the night and day samples. Examination of such a urine chemically will show a low excretion of nitrogen and a low excretion of sodium chloride in many cases.

In chronic parenchymatous nephritis the specific gravity tends to be high, but it is also fixed; that is, it does not vary greatly from period to period. There may or may not be a nocturnal polyuria, but there is a marked diminution in the output of sodium chloride, of water, but in many instances

the nitrogen excretion may be considered normal.

It is evident from what has just been said that certain facts in regard to dietetic treatment are now evident. In chronic interstitial nephritis in which the elimination of salt is impaired, this substance may be used in moderation, but need not be excluded. On the other hand, the very low excretion of nitrogen makes it wise as a rule to cut down on albuminous food to a very large extent, and this becomes the more important if an examination of the blood shows a high protein nitrogen content. But it is to be remembered that depriving these patients of all albuminous food often greatly weakens them. On the other hand, in chronic parenchymatous nephritis where a polyuria does not exist, but a scanty urinary flow is usually present, a distinct limitation of fluid intake should be insisted upon, and if there is any tendency to dropsy a salt-poor diet or a salt-free diet should be used, particularly if salt retention is proved by analysis; but it is rarely necessary to cut down largely upon his proteins, because such a patient eliminates his nitrogenous excreta much better than does the patient with interstitial nephritis.

It is not to be forgotten in such cases that a condition exists which is somewhat akin to that which is present in diabetes, in which the body destroys itself to obtain what it needs for its vital processes. If the patient is deprived of all nitrogenous food he utilizes his own body protein, for in a normal body every man requires not less than two ounces of protein to maintain his nutritional balance. When Janeway, not long before his death, said that to deprive every patient with albuminuria of meat is evidence of colossal ignorance or inexcusable mental laziness, he emphasized a point which should never be forgotten. Every practitioner of experience will probably remember cases of nephritis in which patients rapidly lost strength and vigor when put upon a meat-free diet, and rapidly regained them, at least for a time, when allowed to partake of albuminous food.

In the paragraph above we stated that these patients might be allowed as much as 2 ounces of protein a day. This amount is contained in about three pints of milk, 6 or 7 eggs, and half a pound of lean meat, white or red.

Many years ago we pointed out that the strict milk diet in nephritis was a grave mistake. The excess of fluid cannot be gotten rid of in parenchymatous nephritis, and exaggerates the polyuria of interstitial nephritis; it burdens the digestive tube with an excess of liquid and of protein and fat. It does not provide the normal amount of carbohydrate, but exaggerates the amount of protein to twice the amount which a man needs in twenty-four hours.

It is not to be forgotten that a patient who is placed on a pure milk diet must ingest from four to six quarts of milk in twenty-four hours to obtain the necessary number of calories upon which to live. If he does not receive this amount, he is bound to turn upon his own tissues and destroy them in the process of maintaining vital function.

We have also repeatedly pointed out in these columns that the common idea that red meats are more deleterious than so-called white meats has long since been given up by those who are fully informed in matters concerning renal disease.

IS CASTOR-OIL AN OXYTOXIC?

This question is asked by Cooper in the *Journal of the Arkansas Medical Society* for December last, and he seems ready to answer it in the affirmative, quoting certain authorities in support of his views, and receiving support from some of those who discussed his paper when he read it before the Arkansas Medical Society.

He admits that his introduction of castor-oil as an oxytoxic was the result of an interview with an old negro midwife, and that taking this hint he has employed this purgative constantly ever since with results which are encouraging. In his hands, however, castor-oil is used over a much longer

period of time than is common with many obstetricians. Thus it has been his habit to state to a patient that if she wants an easy labor she should begin about two weeks before the expected time and take two tablespoonfuls of castor-oil every night, with another dose on the day that labor begins. Cooper's observation is that this shortens the first stage materially, the cervix rapidly and painlessly dilating.

There can be no question that long before the negro midwife suggested to Cooper this use of castor-oil many practitioners had been prone to employ it, but usually, we believe, it has been used with the idea of starting labor when it seemed to be dilatory, and in a single dose; in other words it has been employed by many to precipitate labor when everything seemed ready and it failed to occur.

The interesting point arises as to whether castor-oil, over and above its effect of moving the bowels and thoroughly emptying the rectum, possesses any direct or indirect influence upon uterine contraction and upon cervical dilatation. If its influence depends solely upon its purgative properties, it is surprising that other purgatives are not generally used for the same purpose. Possibly at some future time, as the result of experimental investigation, it will be proved that this clinical application of the oil has a better reason for its employment than the mere supposition that it acts by emptying the intestine.

ABDOMINAL PAIN IN CHILDREN.

It is a fact well known to all practitioners that even adults are often incapable of accurately localizing or orienting pain which is felt in the abdominal regions, and this is still more true in the case of children, who by reason of lack of experience and inability to express themselves may readily mislead the physician.

It is well to bear in mind that there are a number of conditions which will cause a child to complain of pain in the abdomen.

Some of them arise outside the abdominal zone and some within it. Amongst the extra-abdominal conditions which are always to be considered is spinal caries, which is probably present in many cases which are overlooked. Where there is lateral deformity the diagnosis may be easy if the back is examined, but where the difficulty causes some anteroposterior change, this condition may be readily overlooked, the more so as the pain may develop sharply when the condition in the vertebral column is as yet very young. Careful inspection and palpation with the development of a painful point, or points, in the spine, and possibly that great addition to physical examination, the use of the *x*-ray, will clear up the diagnosis.

Occasionally, too, a very small umbilical hernia which only appears at times, and which consists chiefly in a small portion of the omentum being pinched, will be the cause of abdominal pain, while hip disease in its early stages, either tuberculous or non-tuberculous, if it occurs in the right side, may lead to a diagnosis of appendicitis. So, too, a pneumonia at the base of the right lung, often associated with a certain degree of pleurisy, will often induce what is apparently severe pain on the right side of the belly, not alone in the neighborhood of the liver, but in the neighborhood of the appendix as well. The sudden onset of pain, often associated with vomiting and with the presence of a marked leucocytosis, greatly increased by pressure below the diaphragm, may readily lead to a diagnosis of acute appendicitis, but here a careful examination of the chest and the high temperature, which is commonly present in pneumonia and rare in appendicitis, will help to make the differential diagnosis. Again, in some cases pericarditis will give rise to epigastric pain, moderate fever, and some abdominal rigidity.

This whole subject is discussed in a very clear manner by Hutchison in a recent issue of the *British Medical Journal*. Speaking of the intra-abdominal causes of pain, he divides them into cases of sudden or "catastrophic" pain and cases of chronic

or recurrent pain. By catastrophic cases he means those in which the onset of the pain is so sudden that it is almost like a stroke out of the blue. Cases of this nature he thinks are less common in children than they are in adults, for perforation of a gastric or duodenal ulcer, acute pancreatitis, and hepatic colic are exceedingly uncommon in children as compared to their frequency in adults. A very rare condition is Henoch's purpura with abdominal extravasation. Renal colic is also rare, but does occur in children. Occasionally children suffer from a sharp onset of pain as a result of eating something exceedingly indigestible, as, for example, green apples. In such cases the history of the case, the application of heat to the belly, giving an enema, combined with watchfulness as to some more severe trouble, is the course to be pursued.

In appendicitis pain is usually a very early symptom, and in children is nearly always accompanied by vomiting, but the vomiting is a secondary symptom and does not persist as in cases of cyclic vomiting. An important part emphasized by Hutchison is that when looking for muscular rigidity of the belly wall in children light palpation is more important than in the case of the adult.

In acute intestinal obstruction there is nearly always pain of a severe character, but in some cases of intussusception pain may be entirely absent, fever absent or very moderate, and the patient may not seem at first to be severely stricken. There is usually abdominal rigidity, and in such cases it may be wise to give a whiff of chloroform to relax the abdominal wall when the typical sausage-shaped tumor can be felt on deep palpation.

Other conditions which may be thought of are ordinary wind colic, which probably occurs less frequently than it is said to occur, and is always associated with a certain amount of tympanites and expulsion of flatus.

Worms do not often cause real abdominal pain, although when roundworms are present in very large numbers so that they

produce intestinal obstruction, pain may be a symptom of their presence.

In cases of tuberculosis of the mesenteric glands the appearance of the child, its history, and the finding of these nodules by palpation or by means of the *x*-ray will enable a diagnosis to be made.

PERITONITIS.

Well within the memory of many practitioners peritonitis, except in its strictly localized form, had with few exceptions a fatal termination. Perhaps the period of its largest incidence and greatest fatality was that which ushered in the first steps of abdominal surgery. The peritoneal cavity was regarded as the most sensitive to microorganism invasion and the least fitted to resist; to guard against even possible contamination through the medium of the air, Lister's carbolic spray was used with such enthusiasm that after a busy day the urine of the operators and assistants was often smoky.

At the present time peritonitis is not regarded as of hopeless prognosis at any stage, unless when the patient is seen he has already received his fatal toxic dose and his death is inevitable, even though the processes causing it are stayed.

As a result of experimental investigations and clinical observations and of surgical practice the feeling has become general that the peritoneum is an extremely resistant structure, slow to infection, prompt and efficient in its defence, and that the patients who die with symptoms of acute peritonitis perish, not because of this inflammation, retention of pus, and absorption of the products of infection, but from a combination of causes, among which and of even more importance than absorption from the peritoneum is absorption of poisonous matter contained in the paretic intestines and incubated there under circumstances most favorable for bacterial growth. The action of intestinal bacteria on the proteins and their split products

produces a poison of extreme virulence. When, in addition to the intestinal paresis of peritonitis there is interference with the blood supply of the gut, such as is most marked for instance in cases of internal strangulation, the lethal effects are more prompt in development than when obstruction is uncomplicated with a condition that predisposes to lowered vitality or necrosis of the intestinal mucosa.

That dehydration is a factor in causing death is generally recognized and accepted, though possibly without abundant proof. In any event it is one of the reasons which has prompted the giving of enteroclysis and hypodermoclysis, and the clinical results of these procedures are sufficiently good to justify their continuance. There is also experimental evidence to show that the poisonous substance is due to preverted activity of the secreting structures of the pancreas and duodenum. In any event it seems to be demonstrated that the cause of death is in the main the absorption from the intestinal canal of toxic substances, from which it would appear that in cases of advanced peritonitis, in addition to the surgery needed for the stopping of the process and securing of adequate drainage, there should be a means devised by which the toxic intestinal content might be evacuated. It is on this subject Collins (*Minnesota Medicine*, January, 1921) contributes an article in which he urges this procedure. He quotes a paper by Cooney, who drained by catheter in cases of typhlitis and perityphlitis with 22 successful cases. In the absence of details it would seem that a similar successful series without such drainage might be reported by many surgeons.

Collins employs a large-sized rectal or stomach tube or other non-collapsible rubber tube, with a quarter-inch lumen or larger, and quarter-inch windows are cut at intervals of about three-quarters to one inch apart in the sides of the tube from tip to about five inches above the tip. The customary purse-string is placed around the appendix base, the appendix amputated,

and the stump inverted. The tip of the tube is then pushed in through the stump, and deflected slightly and guided through the ileocecal valve into the ileum and pushed forward, until the last or upper hole in the tube is well within and past the sleeve of the appendix stump. The purse-string is then drawn and tied about the tube, and that part of the cecum is anchored by stitching to the peritoneum at the edge of the wound, interposing omentum between gut and peritoneum. Peritoneal drainage is then provided as may be deemed necessary, the intubation tube occupying one angle of the wound, while the peritoneal drainage occupies the other angle. The holes in the sides of the intestinal tube provide vents for both the small and the large intestine. The ileocecal valve is thus held open.

Through the lumen of the intestinal tube a small-sized rubber catheter, with blunt nose, may be introduced to the full length of the intestinal tube, and even beyond the end of it into the small intestine, for the introduction, by funnel or syringe, of saline solution or liquid nourishment, according to the method of treatment which may be desirable to follow. Gases and liquids have access to the outside from either small or large intestine by means of the perforations in the sides of the intubation tube. After the removal of the tube the sleeve of the appendix stump collapses and healing takes place readily, as in the inverted gall-bladder fundus following drainage. Should the sleeve of the stump be everted in drawing out the tube it should be at once inverted and that part of the wound strapped together.

In the larger centers in most of the hospitals deaths from appendicitis are rare because of early operation and prompt diagnosis. The complication of appendicular inflammation with diffuse peritoneal inflammation and ileus is also rare, although it occurs more frequently than it should.

Given a gangrenous appendix and a belly full of turbid fluid the results are usually good even in the absence of intestinal

drainage. Where the case is complicated by profound toxemia, vomiting of the recurrent type, and an absolutely quiet belly, continued drainage of the intestinal content has many times proven life-saving.

MORTALITY AND END-RESULTS IN SURGERY.

One of the reasons for the delay in standardizing surgical procedures is incident to the fact that surgeons as a whole have been singularly remiss in reporting both their mortality and their end-results. By and large, current literature is made up of reports of individual cases, favorable results in small groups of cases, exploitation of inadequately tested methods or drugs, description of abnormalities of an unusual nature, rehash of current and accepted knowledge, futile animal experimentation, descriptions of technique which when it is good was probably known and practiced by the early Egyptians, but few frank and truthful statements of mortality and end-results.

Therefore the paper by W. J. Mayo (*Surgery, Gynecology and Obstetrics*, February, 1921), who is recognized by the profession as singularly endowed with sound common sense uninfluenced by the fads of the day, gifted with that spirit which leads him to the prompt recognition and adoption of every method which will increase efficiency, and incapable of that self-deception more pernicious in a writer than even the intention to deceive; such a communication is of more than passing value to the surgeon who has lost himself in the glory of his work.

In the interest of the profession at large rather than in that of his hospital or himself, Mayo for the past twenty years has charged all deaths in St. Mary's Hospital to operation without regard to the length of time thereafter and the actual cause of death. In 1919, 10,280 operations were performed by ten surgeons working under similar conditions, with a mortality of 1.7 per cent. Five thousand, six hundred and

seventy-one of these operations were performed for conditions involving the abdominal cavity. The 265 operations performed on the ovaries and Fallopian tubes, for cancer of the ovaries, all types of ovarian cysts, tuberculosis of the tubes, extrauterine pregnancy, pus tubes, infections, etc., gave a mortality of 0.7 per cent.

The end-results were not comparable to the low mortality. There were serious neuropathic sequelæ, and an intensive study of conservative methods by which such sequelæ can be averted is relatively of greater importance than the study of the mortality.

Five hundred and thirty-nine hysterectomies were performed with a mortality of 1.6 per cent. For other than neuropathic reasons the end-results are not entirely satisfactory. Subtotal hysterectomy does not give such good end-results as total hysterectomy. The latter rarely has any complaint following operation.

Sir Berkeley Moynihan is quoted to the effect that statistics can be made to tell anything, even the truth. Ninety-six of the 539 hysterectomies were performed for carcinoma of the uterus, without a death. The remarkable effect of radium in certain cases of cancer of the cervix has revealed an agent which can be applied more or less successfully to a large group of advanced carcinomata of the cervix that formerly gave rise to a high operative mortality.

The treatment of carcinoma by radium previous to operation has much to commend it.

Over one thousand cholecystectomies with a mortality of 1.6 per cent. This operation has to a large extent taken the place of cholecystostomy.

One hundred and thirty-nine operations were performed for stones in the common and hepatic duct, with a mortality of 8.6 per cent, the latter due to late infection and neglected cases. By the use of preliminary transfusion, in the restoration of the calcium content of the blood to normal, the coagulation time of the blood has been reduced from as high as thirty minutes to less than twelve minutes. Careful dilatation

of the duodenal end of the common duct permits bile drainage and may enable stones overlooked in the hepatic duct to pass out with the flow of bile. In a small percentage of cases olive-shaped or cartridge-shaped pigment stones reform in the common duct following choledochotomy and require a second or even third operation for final cure. The value of bile drainage to the surface following operations of the biliary apparatus has been overrated.

Eleven hundred and eleven operations were performed on the duodenum for acute and chronic ulcers and their complications, with a mortality of 0.9 per cent. The end-results were satisfactory in 95 per cent of the patients with demonstrable ulcers.

More than two hundred gastroenterostomies have been cut off which had been made needlessly because of mistaken operation. The results of excision of large ulcers because of hemorrhage and end-to-end union of the duodenum to the stomach by means of catgut have been so excellent as to predict an early return to the more localized treatment of duodenal ulcers, as devised by Finney, without recourse to gastroenterostomy.

One hundred and sixty-three operations were performed for gastric ulcer and its complications, with a mortality of 2.4 per cent. The end-results were about 85 per cent satisfactory. Gastroenterostomy often fails to cure gastric ulcer unless the lesion is obstructive at the pyloric end of the stomach, and excision often fails unless the ulcer is small at the cardiac end. After a suitable specimen is removed for frozen-section diagnosis, excision by cautery with gastroenterostomy is the logical procedure, and in the large calloused ulcer partial gastrectomy is the operation to be preferred.

One hundred and five resections of the stomach were performed for cancer, with

ten deaths. Surgical operations were performed on 63 patients with carcinoma of the large intestine, with eleven deaths, and on 70 patients with carcinoma of the rectum and rectosigmoid, with seven deaths.

Intestinal carcinoma does not involve glands early, and often when the glands are apparently involved they show only infection. Moreover, fixation and involvement of surrounding tissues may still leave the disease local. Mayo has operated on all possible cases. He is not disposed to turn such as are within reach of the hands over to the radium expert, since this latter agency has thus far not shown good results, though palliation is many times noted.

Preliminary colostomy for the purpose of cleansing the part operated upon or keeping the wound clean after operation, and especially for the use of radium in the growth before operation, effects a reduction of mortality and improves end-results.

The two great causes of death following operation in these cases are sepsis and secondary pulmonary complications. The latter are just as frequent under local as general anesthesia. The mere act of handling such infected masses may set free cancerous or septic emboli and cause pulmonary complications which are the immediate perhaps rather than the primary cause of death.

As to end-results few operations on the human body for cancer give those as favorable as are observed after operation on the large intestine. Fifty per cent of the patients operated on more than five years ago have lived more than five years. All types of operation resulted in cures. This is equally true of all types of operation for cancer of the rectum. A controlling factor was glandular involvement; 70.8 per cent of the patients without glandular involvement by cancer were cured.



Progress in Therapeutics

Medical Therapeutics

Scabies, a Possible Menace: Its Recognition and Treatment.

In the *Ohio State Medical Journal* for January, 1921, MILLER states that unless thoroughly attacked scabies is obstinate. The old adage "make haste slowly" certainly applies to the treatment of scabies. The French "while you wait" method seems indeed thorough. At the St. Louis Hospital in Paris the patient is given a bath containing 90 grammes of potassium sulphide in thirty gallons of hot water. After remaining for one-half hour in the bath, he is scrubbed with green soap, using a hand brush; then he reclines for a further period in the bath; in the meantime his clothes have been disinfected. He is then rubbed with sulphur ointment and dismissed. It is not uncommon to see the patient return in a few weeks or months for another sulphur "cure."

A more satisfactory method, in his opinion, is the proper and thorough rubbing by the patient himself. The rubbing is done without the supervision of an attendant, if the clinician has confidence that the work will be done thoroughly. Without a preliminary bath the patient is given an ointment containing 5 per cent balsam of Peru and 10 per cent of sulphur. A minimum of fifteen minutes is taken for the rubbing of each patient. The ointment is rubbed in thoroughly on every portion of the entire cutaneous surface; not even the smallest part is missed, except the face and scalp. The rubbing is repeated for the next three days. A cotton union suit is worn in order to retain the ointment, and although disagreeable, is not removed at bedtime. Sometimes it is necessary to cover the hands and feet, especially in very young children, and this is done, of course, by wearing suitable gloves and stockings. Especial attention is given to the genitals,

buttocks, and breasts while rubbing. Great care must be exercised while rubbing not to cause a sulphur dermatitis. On the fifth day a warm bath with plenty of soap is ordered, together with a change of clothes. All articles of clothing must be carefully disinfected. During the course of rubs inquiry is made of other members of the family for suspected scabies. It is this lack of thoroughness in which lies the fault of the French system, as outlined above. Following the bath the patient reports for inspection, and if there is evidence of an irritation of the skin or itching, the patient is given a dusting powder. If the irritation of the skin from vigorous rubbing or if the irritating effects of the sulphur are at all marked, a bland ointment answers admirably. Occasionally it may be necessary to repeat the course of sulphur rubs, or a 2-per-cent betanaphthol ointment may be substituted.

The Source of the Uric Acid Excreted in the Urine After Atophan.

In the *Quarterly Journal of Medicine* for October, 1920, GRAHAM in his conclusions states:

1. The extra uric acid excreted in the urine after atophan cannot come solely from the blood, as the total amount of uric acid in the blood is much too small.

2. If the water of the body tissues contains uric acid in the same percentage amount as the blood there is sufficient uric acid in the body to supply the extra uric acid.

3. The evidence that the uric acid already deposited in the tissues can be redissolved is very weak.

4. Atophan, sodium salicylate, aspirin, or sodium benzoate should be given to gouty people for two or three days of each week.

Infantile Scurvy.

In the *Archives of Pediatrics* for January, 1921, AIKMAN states that it may be well to mention the diseases with which scurvy is often confused. Rheumatism: As Kerley says, "the age of scurvy is not the age for rheumatism." Poliomyelitis has been thus diagnosed. Multiple neuritis, syphilis: If doubtful a Wassermann reaction will clear up the diagnosis. Koplik reports a case in which hemorrhages of the bowel were mistaken for intussusception. He also warns that scurvy be watched for in cases of enteritis that pass pure blood. Osteomyelitis, periostitis, joint or spinal diseases must also be considered. One of Aikman's cases had been diagnosed as "hip-joint disease."

The disease may be prevented by a close supervision of the diet of the child and the administration of an antiscorbutic, if sterilized food has to be given as the chief article of diet. Early administration of orange juice, at six months or before, is to be advised, if sterilized food is to be given. Tomato juice may be used, if oranges are not available. The same foods are to be used in the treatment. In time, no doubt, dried orange juice will be available. In no disease is recovery more spectacular than in scurvy. A few days change an irritable, sickly child into a well infant. All that is necessary is the diagnosis followed by proper diet.

Empyema in Children.

In the *Archives of Pediatrics* for January, 1921, HODGE, in discussing the treatment of empyema, says that to sketch in outline the changes that have come about recently and the chief reasons therefor will be helpful.

There is little doubt that in the past most of us have erred at times in doing too severe an operation on these children, particularly the younger ones, and often in operating too early. In the streptococcus type, with thin fluid and few or no adhesions, early rib resection or intercostal incision has made too sudden and severe a change in intra-

thoracic pressure. The aim should be to limit the size of the open pneumothorax. This is especially true where the patients are still ill with pneumonia. In such cases aspiration relieves pressure and dyspnea and tides the patient over until adhesions have formed and the general condition improved. Then formal operation becomes far less dangerous. The aspiration may be repeated several times at intervals of a day or more.

Aspiration as a curative measure has not been successful and is no longer used. To prepare for a safer subsequent operation, it is a very valuable procedure. It can and should be done by the physician in attendance or in consultation with the surgeon. Aspiration with injection of formalin-glycerin solution was advocated by the late John B. Murphy. While it has cured some small collections, usually of pneumococcal origin, it is too uncertain to be recommended.

Intercostal incision is the operation most generally applicable in children, often preceded, as stated above, by aspiration for temporary relief. Formerly rib resection was preferred because the narrow intercostal space in children did not permit finger exploration of the cavity and drainage tubes were in danger of being blocked by rib pressure. Too large or stiff a tube also can cause rib necrosis. The change in opinion has come about largely as a result of the great advance of the war period—the Carrel-Dakin method.

Where formerly an acute empyema was never irrigated, now flushing with the sodium hypochlorite solution is generally used. It is well first to test for a lung communication with salt solution before starting the hypochlorite. Like all other good things the Carrel-Dakin method can be abused and should be used with brains. Fundamental surgical principles must still be observed. Most failures are due to such mistakes. The essential requisites for healing are sterilization of the cavity and lung expansion to obliterate the pneumothorax and restore negative pressure. To the former of these the Carrel-Dakin method

is a valuable aid. A good-sized drainage tube for overflow, several small tubes for inflow, and the two hourly introduction of a quantity of solution somewhat less than the measured capacity of the cavity—these are the chief essentials.

A useful sequence is to use tube drainage in an intercostal incision for a few days. If the age and condition of the child permit, it is an advantage to make this of the siphon type, thus limiting the pneumothorax and saving dressings and disturbance. Then the tube is supplemented by the Carrel-Dakin irrigation. The sodium hypochlorite solution has a marked solvent action on the masses of fibrin found in the pneumococcal cases. Its most enthusiastic advocates assert that it dissolves adhesions even when more or less organized, thus aiding lung expansion.

Rib resection is reserved chiefly for cases in which intercostal incision has been inadequate and for old cases with sinus or rib necrosis. It has often to be combined with freeing adhesions, sometimes amounting to partial decortication of the lung. The after-treatment is conducted along lines identical with that of the simpler operation.

Both intercostal incision and rib resection can be done very readily with local anesthesia infiltration. In the presence of marked fright or when adhesions must be broken up, general anesthesia is necessary, preferably gas-oxygen. The prone position, introduced by Elsberg, has been helpful in his experience.

Along with these operative measures, exercises to expand the lung should be stressed as early as possible. Too frequently this is neglected by surgeons. Whether in the form of toys, balloons, soap bubbles, masks, water bottles, or by crying, it is of great value and often turns the tide in favor of expansion and healing.

By this scheme of graduated operative treatment more lives will be saved, and mutilating operations for collapse of the chest wall will be almost entirely avoided. The Schede and Estlander operations are seldom necessary in children, and we may now hope for their complete disappearance.

With their attendant ills of deformity, contracted chests and lateral curvature, they can well be spared.

A point often not sufficiently realized is the great drain on the child's metabolism through the profuse discharge in empyema. This should be met by prompt raising of the food intake. The ways and means of introducing the necessary calories are very familiar. To this factor, as well as to inability properly to expand the lung, may be attributed the observation that babies often do well for a week after operation and then fail. Most surgical troubles after operation are due to poor drainage and imperfect sterilization of the cavity. Lung abscess, pneumonia in another lobe or opposite lung, pericarditis, and other complications do occur. But the burden of proof is on the surgeon to show that the source of trouble is not in the drainage tract.

The Neuroses and Their Treatment.

In the *New Zealand Medical Journal* for December, 1920, FENWICK states that the psychasthenic types, particularly the obsessional neurosis cases, and the fixed phobias, agoraphobia, claustrophobia, etc., are difficult to treat, and it is in these cases that psychoanalysis becomes a necessity. It is with them that suggestion has failed. Although Déjerine stated that persuasion was the only rational form of psychotherapy, neither he nor his followers have proved that suggestion therapy can cure in these cases. Neither will any extent of reasoning with the patient do so. Tell the patient who fears that he is going out of his mind, who is afraid of open spaces or of walls, that his fears are groundless and unreasonable, and he will agree that he has known that all the time, and state his fears remain nevertheless.

There is only one way to get at these patients, and that is to scrutinize their past histories and dig up the emotional trauma or shock or repression that originated the present distorted emotional reaction, *i.e.*, the fear. Bring this original incident to light and make the patient talk about it

freely. Once he can do this, once the repression is gone, the obsession will go too, for chronic fear or dread is an involuntary, not a voluntary, mental activity. Having got thus far one must reëducate. For example, he had a patient who dreaded hills. His dread had become an obsession so deeply rooted that it had become a physical impossibility for him to climb a hill. It needed no skilled psychoanalysis in this case to get back to an emotional shock he had once had while climbing a hill, though he had forgotten the incident and in no way connected it with his condition. This incident was discussed with him for several days, and then, and not till then, explanation to him of the cause of his condition was followed by suggestion and assurance that he would now be able to climb hills without any dread or other ill effect. Then the process of reëducation was commenced, and he walked up neighboring hills, first in the company of other patients, and then by himself. He left the hospital completely cured. Suggestion, or reëducation, could not accomplish this result by itself. The essence of the treatment is the reacting of the original trauma.

In conclusion, with regard to the application of our limited knowledge of endocrinology to the treatment of neuroses, Fenwick says, to begin with, the first essential is that we must realize that endocrinological treatment is symptomatic only. If we recognize this limitation, judicious administration of certain gland products should prove a valuable help in treatment.

In a paper on "Hyperthyroidism" Hardwick Smith outlined the first practical advance made in endocrine gland studies by Eppinger and Hess, who, dividing individuals into one of two types, vagotonics and sympathicotronics, noted that the vagotonics gave a violent reaction to the injection of adrenalin. Langdon Brown, while admitting the possibilities in this work, hesitates to believe in the existence of these two types, and, amongst others, he advances one most striking argument against the theory. Pilocarpine, Eppinger and Hess contend, stimulates the vagus; it is the drug that

causes the excessive reaction in vagotonia. Pilocarpine causes sweating. Anatomical evidence shows that the sweat nerves are part of the sympathetic system, not the autonomic, vagus system. Eppinger and Hess, to fortify their theory, say that the sweat nerves, anatomical evidence notwithstanding, must be part of the vagus system. The assumption is unjustifiable. Wounds in the neck, severing the cervical sympathetic chain, have produced absolute paralysis of the sweat glands of one side of the face and other parts supplied. Another statement made by Eppinger and Hess is that the diaphragm is low in vagotonics, and to consequent lack of support of the heart they attribute certain cardiac neuroses. The explanation might be helpful, could they prove that the diaphragm is innervated by the vagus, not by the phrenics.

Stimulation of the sympathetic serves to prepare the body for a struggle and to make it ready for flight or defence. Shock and stimulated emotion are the causes of this preparation. The same cause which disturbs mental activities, setting them into violent agitation or holding them in abeyance (as when paralyzed with fear), stimulates also the sympathetic nervous system. The pupils dilate, the heart beats more quickly and more forcibly, and the sweat glands are more active. These actions are emotional responses.

Now, how can we apply this knowledge to the treatment of neuroses? It seems to Fenwick that the administration of endocrine gland extracts is really indicated in the asthenic types, *i.e.*, in true neurasthenia, and that it is contraindicated in the psychoneuroses. He does not believe that in disease the distinction of vagotonics and sympathicotronics is a practical one. He thinks we have to deal with sympathicotronics and sympathasthenics, that the disorders are of the sympathetic proper, not the parasympathetic, autonomic or vagus system, and that these disorders are in the nature of underaction or overaction. In the cases of underaction we can do good by the administration of glandular extracts,

particularly suprarenal extract. For though all the endocrine glands are activated by the sympathetic system, and their secretions in turn stimulate the sympathetic nerves, it is the suprarenals that are most intimately associated with sympathetic nervous action.

He thinks that the use of endocrine gland extracts is not indicated, and in most cases is contraindicated, in all other types of neuroses, where it is evident that sympathetic action is excessive. The only cases of psychoneuroses in which endocrine gland extracts could be of benefit are those in which, from long-continued overaction, there is obvious sympathetic exhaustion.

It is his intent in this paper to urge the claims of those who suffer from neuroses and psychoneuroses, and to ask that we should endeavor to devote more time and consideration to these patients. In doing so, may we not possibly find a means of preventing certain organic diseases? He refers particularly to Graves's disease, or hyperthyroidism. It is surely recognized that some cases of this disease owe their origin to an emotional trauma. The sequence of events in such cases seems to be (1) emotional trauma, (2) overaction of sympathetic nervous system, (3) overaction of thyroid gland. Overaction of the thyroid gland leads to further stimulation and activity of the sympathetic, and the vicious circle is well established. Surely it is not unreasonable to claim that in some cases the reaching of this stage is preventable by dealing properly with, and teaching the patient to deal properly with, the underlying cause—the original emotional trauma.

If there is one particular class of patient that is doing much to build a reputation for the various kinds of unqualified practitioners who advertise themselves under a multitude of peculiar and puzzling names, it is the psychoneurotic. It is with such patients that these practitioners work their marvelous cures. The cures are, of course, cures of symptoms only, because the underlying cause is not sought for. But by their absolute assurance and by their methods of suggestion—quack methods as we call them—these people do cure their patients of

many troublesome symptoms. To how much greater a degree can we obtain the same results, but more permanent, if we will only devote our time and trouble to these patients! Fenwick firmly believes that these patients drift to the unqualified practitioner just because of our indifference, or apparent indifference, and slighting of their troubles. Let us always remember that their ailments are to them very real and very terrible.

Effect of Chloroform on Ether Hyperglycemia.

In the *American Journal of Physiology* for January, 1921, Ross and Davis state in their summary that a group of dogs was anesthetized with ether for half an hour. The next day the dogs were anesthetized with the same drug for fifteen minutes. The blood-sugar changes were measured for the first fifteen minutes of anesthesia both times.

A second group of dogs was anesthetized with chloroform for half an hour, and the following day each was given fifteen minutes of ether anesthesia. The blood-dextrose changes the second day were measured.

A third group of animals fasted two days and was then treated the same as the second group.

Half an hour of ether anesthesia did not alter the glycemia of the following day, and did not decrease the hyperglycemia resulting from fifteen minutes of ether anesthesia.

Half an hour of chloroform anesthesia produced on the following day a glycemia lower than normal, an increase in blood dextrose due to fifteen minutes of anesthesia less than normal, and a hyperglycemia from fifteen minutes of ether anesthesia lower than normal.

A fast of two days preceding half an hour of chloroform anesthesia produced on the following day a still lower glycemia and still less reaction to fifteen minutes of ether anesthesia than occurred in non-fasting dogs.

These results in conjunction with the conclusions of Davis and Whipple (2) that

the liver injury produced by chloroform is increased by a fast preceding anesthesia leads them to the following conclusions:

1. Ether anesthesia does not produce any injury to the mechanism of dextrose mobilization that can be detected the following day.

2. The injury to the liver cells produced by chloroform anesthesia reduces the glycemia of the following day and injures the mechanism of dextrose mobilization according to the degree of injury.

3. The hyperglycemia due to chloroform anesthesia is not due primarily to the direct action of chloroform on the liver. Probably chloroform, like ether, produces hyperglycemia chiefly through its depressing action on the internal secretion of the pancreas.

Quantitative Studies in Chemotherapy.

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1921, VOEGTLIN and SMITH state that six different brands of arsphenamine, including a German preparation, have shown approximately the same trypanocidal activity.

Slightly greater variations in activity were observed with six different samples of neoarsphenamine, the maximum difference being 80 per cent.

There appears to exist no relation between toxicity and trypanocidal action of arsphenamine and neoarsphenamine.

It is suggested that the alleged greater effectiveness of arsphenamine over neoarsphenamine in the treatment of human syphilis may be attributed to the fact that arsphenamine is precipitated at the hydroxyl ion concentration of the blood, in consequence of which the rate of its oxidation and elimination from the body is considerably diminished.

The study of the trypanocidal action of some aliphatic arsenicals has confirmed the fundamental principle formulated from the previous study of the aromatic arsenicals, viz., that the trivalent oxides are the only forms of arsenic which exert a direct toxic action upon protoplasm.

Cacodylic acid does not possess any trypanocidal action even in lethal doses. Methyl and ethyl arsenic acid show a parasiticidal action only when used in doses approaching the lethal dose.

The Treatment of Acute Nasal Sinusitis.

In *The Practitioner* for January, 1921, THOMSON states that acute sinusitis is very amenable to simple treatment. No great technical skill and no heroic measures are required. It is more important to have the Hippocratic art of seeing that the patient and his *entourage* appreciate the advice given—for what they may despise as “only a cold in the head”—and of getting them to carry it out.

The indications are to facilitate the discharge and soothe the pain.

The patient should remain in bed, the whole head being wrapped in a large muffler, a woolen shawl, or the knitted head-piece known as “a Balaklava helmet.” Warmth is applied to the affected forehead or cheek by means of a small india-rubber hot-water bottle, or a pocket flask filled with hot water, or the Japanese muff warmer called an “Instra.”

A nasal inhalation of mentholized steam is taken for four minutes every hour or two hours. It is ordered thus:

R Menthol, gr. xxx;
Tincturæ eucalypti (vel spirit.
vini rect.), fʒij.

S.: To a jug half full of boiling water add a teaspoonful of this. Arrange a handkerchief as a cone over the jug, and sniff the steam up the nostrils.

Or this:

R Eucalyptol, fʒj;
Menthol, grs. xxx;
Tincture of benzoin, fʒij.

(Menthol is not suitable in young children, and for those who find it too stimulating it can be omitted from the last prescription.)

The effect of these steam inhalations is to “clear the head.” The turbinates contract, the mucosa is slightly anesthetized, there should be a free outpouring of mucus and

muco-pus with great relief to the "stopped-up feeling," the obstructed nose, and the loss of the sense of smell.

If the practitioner is skilled in nasal manipulation, he may, once or twice a day, for a few minutes place a pledget of cotton-wool in the middle meatus, after it has been squeezed out of a two-and-a-half to five-per-cent solution of cocaine, to which a few drops of adrenalin have been added. Or the patient may give himself, from a small spray, three puffs of this solution up each nostril two or three times a day. Between whiles the vestibule of the nose should be greased with vaselin, menthol, or boric ointment, or the proprietary nasal cream:

Boric acid, 16.00 parts;
Menthol, 4.0 parts;
Cocaine, 0.10 part;
Thymol, 0.05 part;
Oleaginous base, 144.00 parts.

Nose lotions, during an acute sinusitis, are useless, for the nasal chamber is generally too obstructed for them to penetrate far, and there is a risk of the lotion carrying the pus into uninvaded sinuses or into the middle ear. But as soon as the thoroughfare through both nasal chambers is restored, and they begin to discharge freely, an alkaline nose lotion—as warm as the hand will tolerate—can be carefully sniffed or sprayed into the nose. The following is soothing and can be used in a spray:

℞ Sodii bicarbonatis, gr. iij;
Sodii bibor., gr. iij;
Acid. carbolic pur., gr. j;
Sacchar. alb., gr. v;
Aq. ad, ʒj.

To an ounce of this spray the addition of a quarter of a grain of cocaine is very grateful and comforting, or the well-known nasopharyngeal soloid can be used. An alkaline gargle and mouth-wash will clear some of the discharge which escapes by the postnasal route, and will mitigate the unpleasant results of the mouth-breathing induced by the swollen turbinals during the acute stage:

℞ Acid. carbolic pur., ʒvj;
Sodii bicarb., ʒss;
Glycerini, fʒxij;
Aque coloniensis, q. s. ad fʒiv.

S.: A small teaspoonful in a small tumbler of warm water as a gargle and mouth-wash.

Local Applications.—The special suction apparatus of Sondermann is sometimes helpful, and it may be imitated by the patient holding his own nostrils and then inflating his lungs, so as to exhaust the air from the nasopharynx. Brünings's electric light head-bath is convenient and useful, and it is a pity it is not more regularly found in stock with surgical instrument-makers, who might hire it out.

Medical Treatment.—A few doses of acetylsalicylic acid, phenacetine, antipyrin, or even morphia may be required. Thomson has found that the following mixture helps to make the patient comfortable:

℞ Sodii salicylat., gr. x ad xx;
Phenazoni, gr. v;
Spirit ammon. arom., min. xv;
Elixir rubri, min. xl;
Aq. cinnamomi, q. s. ad fʒj.

Absorption of Local Anesthetics Through the Genito-urinary Organs.

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1921, MACHT states that as a result of his various experiments it is evident that local anesthetics are very easily absorbed through various organs of the genito-urinary tract, with the exception of the bladder. Of great scientific as well as practical interest is also the difference between the absorptive powers of the urethra as compared with the bladder. Whereas drugs are very easily taken up through the urethral walls, they are very slowly absorbed from the bladder. These experimental data agree very well with the experiences of both urologists and gynecologists, so far as he has been able to ascertain. The absorption of cocaine through the ureter and pelvis of the kidney is chiefly of scientific interest; and in view of the modern use of drugs, such as iodides, thorium, etc., in these structures, the subject may also be of some practical importance. Absorption through the prepuce is important from the surgical point of view, as local anesthetics are very widely employed in this connection, and their careless or excessive use may lead, and has led,

to toxic symptoms in patients. The absorption of local anesthetics from the vagina is also interesting, even though these drugs are not so widely introduced into that canal as other poisons are, such, for instance, as the antiseptics mercuric chloride, phenol, lysol, etc.

The local anesthetics—cocaine, alpin, and apothesine—were studied in regard to their penetration through and absorption from various genitourinary organs.

It was found that these drugs are more or less readily absorbed through the urethra, ureters, pelvis of the kidney, preputium, and vagina.

The Practical Gains of Clinical Cardiology Since 1900.

In the *British Medical Journal* of January 1st, 1921, GORDON, in speaking of treatment, states that Dr. Caton has added an important chapter to the subject of preventive medicine by showing how we may prevent many cases of incipient rheumatic endocarditis from passing into permanent valvular disease by prolonged rest in bed, the administration of sodium iodide, and the application of blisters.

Dr. Arthur Goulston, by his ingenious use of cane sugar, has given us a valuable aid in dealing with chronic heart failure. It is noteworthy that beet sugar is without effect and that the cane sugar must not be cooked.

The intravenous use of strophanthin in urgent cases has been found of unmistakable value. Theocin sodium acetate has proved its usefulness in dropsy which has not yielded to other diuretics. Brunton's insistence on the importance of morphine in the distressing dyspnea of late heart disease has promoted its general use in that condition, and the discovery of the immediate value of its hypodermic injection in acute pulmonary edema (which occasionally occurs in cardiac patients) has put a valuable weapon in our hands. In "soldier's heart" graduated exercise has expedited the generally slow recovery.

Strychnine has been unduly discredited.

Surgical shock, in which it has been rightly replaced by pituitrin, is a different condition from ordinary heart failure, and although there are those who prefer injections of camphor in cardiac breakdown, we shall do wisely if we hesitate to discard from our therapeutics a remedy which the sober judgment of competent clinicians has so long relied on.

The use of salvarsan in cardiac syphilis appears to have special risks, and, if used at all, it should probably be given in smaller doses than ordinary.

In streptococcal endocarditis (the most frequent variety) he has learned that whereas antistreptococcal serum occasionally succeeds, streptococcal vaccines almost invariably fail. Standardized digitalis is a valuable advance.

Three surgical procedures require medical notice: Brauer's operation of "cardiolysis" is of service where a heart is gravely hampered by adhesions of the pericardium to the chest wall. Direct massage of the heart through the diaphragm, in cases of heart failure under operation, has been the means of restoring life. Incision of the pericardium seems at last to be recognized as a safer proceeding than the older paracentesis.

Etiology of 150 Cases of Bronchial Asthma.

In the *California State Journal of Medicine* for January, 1921, PINESS concludes his contribution as follows:

1. Asthma is a clinical manifestation produced by protein sensitization.
2. It is important that careful physical and laboratory examinations should be made before the diagnosis is established.
3. Most painstaking, careful history of the patient is a necessity, as it establishes the etiological factor in many cases.
4. Heredity is an important predisposing but not exciting factor in from 25 to 50 per cent of the cases.
5. Climate has very little bearing on the etiology excepting in the pollen and asthmatic bronchitis types.

6. Eczema, urticaria, and angioneurotic edema have definite relationship to the protein sensitive asthmatics.

7. It is possible with cutaneous tests to determine the etiology of bronchial asthma in 47 to 50 per cent of cases.

8. Multiple sensitization is common, particularly in the food and pollen groups. Sensitization to one protein in early life is apt to be followed by sensitization to other proteins.

9. Renal and cardiac diseases may complicate asthma, but the latter is a distinct and separate condition, not dependent upon the former.

10. Patients with a history of onset past thirty-five years of age rarely give positive skin reactions, but serum agglutination tests to staphylococcus pyogenes aureus occasionally give positive reaction and determine the cause.

11. There is no fixed relationship between cutaneous reaction, serum agglutination tests, and isolation of straphylococcus aureus from sputum or nasal secretions.

12. The relationship between the age of onset of asthma and sensitization of different types of protein is very important, but all ages are liable.

13. Endocrine dysfunction bears a prominent part in the etiology of asthma, particularly in the younger individuals, and should be borne in mind when the patient does not respond to specific protein treatment.

Action of Emmenagogue Oils on Human Uterus.

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1921, GUNN states that his experiments on the isolated human uterus and Fallopian tubes agree with the results of other observers on the excised uterus of other mammalia. It would seem that the emmenagogue oils in very small amounts have no action at all on the uterus. In higher concentrations such as could never be reached in the blood without producing dangerous, probably fatal, poisoning, they inhibit the uterine movements.

When abortion occurs after their use, it is probably an indirect result of the severe irritation and inflammation of the bowel and kidney. This may induce congestion and reflex movements of the uterus which may in some cases result in abortion.

The absence of specific stimulant action of these oils on the uterus renders them all the more dangerous poisons, as, after their failure in ordinary doses, large doses are sometimes taken, resulting in frequent poisoning, in a large proportion of cases without the production of abortion.

The Nasal Cavities and Asthma.

In the *Illinois Medical Journal* for January, 1921, SHAMBAUGH, in his summary, states:

1. Asthma is often associated with very definite pathological changes in the nasal cavity.

2. The pathological condition associated with most cases of asthma is the condition known as hyperplastic ethmoiditis.

3. This condition is not only associated with many cases of asthma, but its correction has often a very decided influence on the asthma.

4. The relation between the nasal condition and asthma appears to be not so much one of a nasal reflex neurosis as it is that of an anaphylactic reaction.

5. The improvement in the asthma resulting from operations on the ethmoid may be due to the elimination of foci harboring bacteria and their toxins.

6. Hyperplastic ethmoiditis frequently exists for a long period of years without any tangible evidence, such as the presence of nasal polypi in the nasal cavity. The diagnosis in such cases is made by forced inspection of the floor of the ethmoid in the middle meatus by anterior rhinoscopy or by means of the postnasal mirror.

7. Anatomical variations tending to interfere with the normal ventilation of the ethmoid, especially the high deflection of the nasal septum, may sometimes act as an etiological factor in the production of hyperplastic ethmoiditis.

8. A cure of the hyperplastic ethmoiditis, especially in the early stages, may sometimes be accomplished by overcoming the impaired ventilation of the ethmoid cells—that is, by correcting the deflected nasal septum and by removal of the middle turbinated body.

9. Some cases of asthma are permanently cured by an exenteration of the ethmoid. In other cases, the asthma returns when the polypi reform. In some cases the asthma appears to be but little influenced by the operation on the ethmoid. The explanation of the latter cases may be that the frontal and maxillary sinuses are also the seat of polypoid degenerations.

In discussing this paper Miller said the theory of asthma was now fairly definitely plain, and that what happened in an asthmatic attack was a bronchial spasm. One point that needed emphasis was the danger and unnecessary use of morphine in asthmatics. It was surprising how many were given morphine, and yet they experienced no greater relief than they would from the use of adrenalin. Since asthma was now being looked upon as an anaphylactic manifestation, our attention has been directed away from the nose and accessory sinuses in connection with asthma. The presence of foreign growths, like polypi, might lead to irritation which would give rise to a bronchial spasm in the same manner as bronchial asthma could be produced experimentally in animals. Furthermore, the existence of polypi favored the growth of bacteria. Recovery not infrequently followed the removal of polypi from the nose. This group of cases fell under the classification known as bacterial asthmas. Whether such polypi could act as foreign growths and affect the vagus was a matter which had been discussed.

Formerly, the diagnosis was considered complete when it was decided the patient had bronchial asthma, but now the diagnosis is not complete until we have determined what was the cause of the bronchial asthma. In other words, into what one of the four groups should the case fall? Was it a bronchial asthma due to animal emanations;

was it bronchial asthma due to food or pollen, or was it an asthma due to bacterial infection? We were more and more inclined to believe that all asthmas could be placed in one or the other of these groups. A correct diagnosis was a great aid in instituting proper treatment. Formerly asthmatics were treated by the use of iodides and by climate. A number of asthmatics were relieved by climate, while others were not. It was generally recognized that it was impractical to desensitize a patient who had food asthma. While this could be done, the task was laborious, required much time, and frequently desensitization of the patient was of such short duration that it offered very little hope. In the group of food asthmas it was still necessary to handle them by withholding the particular article or articles of food from the diet.

In regard to pollen asthmas and their treatment, desensitization was fairly satisfactory, but on account of the short period of time the patient was desensitized he required desensitization every six months or a year, which made this method of treatment unsatisfactory in the end. He did not know what the experience of others had been, but his experience with the treatment of bacterial asthmas by the use of vaccines had not been satisfactory.

Blood Transfusion in the Treatment of Pulmonary Tuberculosis.

In the *Illinois Medical Journal* for January, 1921, FREILICH and three of his colleagues, in presenting a preliminary report, state that only advanced cases with unfavorable prognosis were utilized in their work.

The donors in each case were normal individuals with negative complement fixation tests for tuberculosis, negative Wassermanns, and negative tests for iso-agglutinins and iso-hemolysins.

In this series of six cases the patients have received from two to five transfusions at weekly intervals of 100 to 375 Cc. of blood.

Transfusion of over 200 Cc. of blood usually resulted in a reaction characterized by chill, fever, and sweat, with prompt recovery therefrom.

The clinical course in this series of cases was not appreciably altered.

Changes in the blood of the recipients in this series was a steady deviation to the left or no change, as determined by Arneth count.

In conclusion, it is evident that normal blood is devoid of that specific element which will arrest the progress of the disease. Further experimental work is now being carried on with a series of cases in which the donors show a positive complement fixation test for tuberculosis.

Massage of the Heart and Resuscitation.

In the *British Medical Journal* of January 1, 1921, GUNN says that the expression "massage of the heart" had been used as if the manner of performing it were indifferent, but he found experimentally that attention to points of detail may make all the difference between success and failure in difficult cases of resuscitation of the arrested heart. The grounds for certain of these conclusions may therefore be of value.

One question of the first importance is, that rhythmic compression of the heart effects in the first place an artificial circulation; it produces movement of the blood in the vessels to an extent which depends upon the way in which it is done. In animal experiments such as he performed an indication of the mechanical efficiency of massage in effecting a circulation of the blood could be obtained (the blood-pressure being at zero) by the amplitude of the wave of blood propelled into the aorta by each compression of the heart. A record of this wave was obtained by a mercury manometer connected with a carotid artery. But a more direct proof of the fact that massage of the heart acts, to begin with, as a substitute for the spontaneously beating heart in causing a circulation of the blood was obtained in the following way: A solution of a blue-green dye was injected into the cavity

of the right ventricle of an arrested heart. Cardiac massage was then performed, and after a few compressions the blue-green color appeared first in the lungs and then in the carotid artery. Massage had therefore propelled the blood from the right ventricle through the lungs and left side of the heart into the systemic circulation.

Fisher describes this action of massage as "an influence upon the circulation that I have not seen previously observed." It is all the more interesting that Gunn has described independent observations on the same phenomenon but judged by different effects—namely, flushing of the skin and rise of intraocular tension occurring as the result of massage prior to spontaneous beating of the heart.

This action of massage has an importance not merely academic. Gunn has started the heart beating an hour after it has been arrested by chloroform. He has perfused the excised heart of a still-born child four hours after the child was born, and started the heart beating again. The difficulty is not so much in starting the heart, though this may, of course, be difficult, but in starting the heart sufficiently promptly that the other tissues have not meantime been rendered incapable of recovery by stoppage of the circulation. So far as is known, it is the cells of the central nervous system that are most susceptible to stoppage of the circulation, so that, from the practical point of view, the circulation must be started before the cells of the central nervous system are irretrievably damaged. The current opinion is that after complete stoppage of the circulation for about fifteen minutes the cortical cells cannot be revived. While his own experiments have also pointed to this conclusion, he is not convinced that it is true; and, for reasons that he does not enter into, he says he would not be surprised if some day it were shown that even the cortical cells can survive arrest of the circulation for a much longer period. What is known is that they are difficult to revive. It is not proved that they are dead.

Many other tissues can withstand absence of circulation for a long period. Thus he

has revived the movements of the isolated guinea-pig's uterus after seven days' keeping in cold storage, and the human Fallopian tube after thirty hours; the rabbit's intestine after five days; the human vermiform appendix after thirty-six hours; and the heart after twenty-four hours or longer. At higher temperatures they do not survive so long, but even at temperatures between ordinary room temperature and body temperature they survive for hours. In tissues such as these there need be no anxiety in regard to the possibility of restoring their functioning capacity after prolonged arrest of the circulation. The liver requires further investigation.

In the meantime the question of resuscitation may be taken to depend upon how long the cortical cells can survive arrest of the circulation. And it is in this connection that there arises the importance of the capacity of cardiac massage to act as an artificial circulation. For the difference between complete and incomplete stoppage of the circulation is enormous when gauged by the effects on the cells of the central nervous system. It has been found, for example, that when an attempt has been made to occlude the cerebral circulation by clamping the vessels to the brain, much more prolonged survival of these cells may occur if a mere trickle of blood through a small vessel be intentionally or accidentally left. Other phenomena point to the same conclusion. For example, in hibernating animals both circulation and respiration are reduced to a very low level for months, and yet the animals revive rapidly and completely when the circulation and temperature, etc., are restored.

The experiments by Martin and Gunn have been confirmed by Fisher, and it can be taken as proved that massage of an arrested heart, if properly performed, can act as a fairly effective mechanical means of conducting an actual circulation of the blood. This being so, it is more than probable that, for the purpose of deciding whether the cells of the central nervous system are capable of complete restoration or not, the time can be calculated not as

from the start of spontaneous heart-beats but as from the time of beginning massage. This is a point of fundamental importance, and puts a different and more hopeful complexion upon the whole question of resuscitation.

The most effective rate of compression is much slower than the normal heart-rate, for two reasons: One is that a slow rate is necessary to allow complete filling of the ventricles, and the other that it is a sub-normal rate of beat that one is attempting to elicit—namely, the rate at which the arrested heart will begin beating again. The advantage of intermitting massage had not previously been suggested. Possibly if attention were paid to this, attempts to revive the human heart would be more successful.

There is no known drug comparable with adrenalin in efficacy to start an arrested heart or to antagonize the action of chloroform. He has shown that adrenalin can start beats in a perfused mammalian heart—for example, when kept for twenty-four hours—when mere perfusion has failed. When the isolated mammalian heart is perfused with concentrations of chloroform or chloral which almost or even completely arrest the heart, the addition of adrenalin to the chloroform or chloral solution is able to restore the heart-beats to their normal vigor. This is an extraordinary effect. It is not an antagonism of the type, for example, of atropine versus pilocarpine. For chloroform and chloral depress the heart muscle, and in the experiments referred to adrenalin is able to antagonize a concentration of chloroform or chloral which practically or completely stops the heart while the latter solution is still passing through the heart, and its action therefore getting deeper. Gunn does not think that this power of adrenalin—which is equivalent to stimulation of the sympathetic nerve of the heart—to antagonize a muscular paralysis has been sufficiently realized.

When the circulation is arrested in the intact animal, the difficulty, of course, is to get the adrenalin at the heart, even intravenous injection being practically useless

when the heart has stopped. One method is to inject adrenalin into the pericardial sac before beginning massage, but this might be difficult to one who has had no experience of giving such an injection, and he has himself no experience of performing it in man.

Seeing, however, that massage causes an artificial circulation, adrenalin will reach the heart in time from a vein if massage be continued. This will occur sooner the nearer to the heart the vein is into which the adrenalin is injected. If it were injected into an external jugular vein it would very probably reach the arrested heart after a few effective compressions by massage.

One point in regard to adrenalin which may cause confusion is that a combination of adrenalin and chloroform is, as has been pointed out by Levy, more likely to produce fibrillation of the heart than chloroform alone. This, however, refers only to cardiac arrest from chloroform occurring in the initial stages of anesthesia. This danger does not occur, in his opinion, in cardiac arrest occurring at other times.

There is another point in regard to the action of adrenalin about which there seems to be a good deal of misconception, and that is as to the permanence of its effect. It is true that in the normal animal with a good blood-pressure the rise of blood-pressure produced by adrenalin is very transient, lasting only a few minutes. But this is not true in certain abnormal conditions of the circulation—for example, when the animal is being resuscitated after arrest of the heart. Here the blood-pressure may remain low after spontaneous beats of the heart have begun. This low blood-pressure is due partly to temporary paralysis of the vasomotor center and partly to feebleness of the heart's contractions. These two effects interact on one another. This vicious circle is broken by adrenalin. The temporary rise of blood-pressure provides a better blood supply to both heart and vasomotor center, and this may be sufficient to enable both to function properly, and in these circumstances the rise of blood-pressure produced by adrenalin may be

permanent. He believes it may be so in other similar conditions of the circulation.

To sum up, Gunn would venture to lay down the following directions for resuscitation in cardiac arrest in man or animals, whether from chloroform anesthesia or from any other condition in which cardiac arrest is "accidental:"

If the heart has stopped, artificial respiration should be resorted to immediately by the usual methods. If, at the end of three or four minutes, no pulse can be felt, and especially if no heart-beats can be heard on auscultation, adrenalin should be injected into an external jugular vein, by an assistant if available; if no assistant be available, he believes the gain from adrenalin more than compensates for the loss of time, provided the materials are at hand, as they ought to be. In the meantime, or subsequently, as the case may be, the abdomen should be opened high up, one hand inserted in the opening, passed up over the left lobe of the liver, and the heart felt for above the diaphragm. The heart should then be massaged intermittently. He indorses all that Fisher says in regard to not relying upon artificial respiration alone and in regard to boldness of procedure if the heart has stopped. When the heart has stopped there can be no further risk. As soon as spontaneous beats of the heart, however feeble, are felt massage should be interrupted for several beats to allow the contractions to establish themselves; otherwise continuous massage may abolish them again. The heart should then be massaged again for a short time, when the beats will probably improve. When the heart has begun beating it is safer to use too little than too much massage. The hand should not be removed from the abdomen till the heart is beating well. When the heart continues to beat regularly and strongly an intravenous injection of atropine should be given. Artificial respiration must be kept up continuously, also after the heart begins beating. After five minutes it may be interrupted to see if natural respiration will begin, but not for long. No harm is done by keeping up artificial respiration, even if

it inhibits the natural respirations, whereas, on the other hand, it is not safe to interrupt artificial respiration very long, if natural respiration does not commence.

If it be found that positive artificial respiration can be used in man by, for example, a Brodie pump of larger size than that used in the physiological laboratory, the problem of resuscitation will be greatly facilitated.

Natural respiration may be expected to begin in five to ten minutes after the heart begins to beat again, but may be delayed for thirty minutes.

- During the manipulations, and afterwards if these procedures be successful, care must be taken to maintain the body temperature.

The Diet as a Postoperative Factor in Gastrointestinal Disorders.

In the *Medical Record* of January 22, 1921, LEVY states that in the dietetic treatment of all these cases the measures employed for a varying period following the operation should be the same as during the medical treatment of the condition. Although it is advisable for the surgeon for his private cases to have a more thorough knowledge of the action of foods, especially their chemical and physiological action, it is much better for him to work in coöperation with a gastroenterologist proficient in dietetic treatment. This should especially be done in the case of ward patients in public institutions. Each patient becomes a case unto himself and should be treated accordingly. He should be watched as to symptoms, and the diet arranged in accordance with the symptoms. When he is discharged "as cured" by the surgeon, he should be turned over to the care of a specialist in dietetics for a varying period for further observation and treatment.

All foods possessing any stimulating or irritating action should be avoided. All tendencies toward hypermotility and hypersecretion, especially hyperacidity, should be combated. In other words, the stomach and duodenum, as any other part of the

body where a pathological lesion exists requiring rest, should be given as much rest as possible. Rest of the part is the greatest asset toward the healing of the injury; and by rest is meant physiological rest as well as dynamic rest. Stimulating foods are to a certain extent irritating. These foods tend to stimulate or irritate by a mechanical or physiological action. The mechanically irritating foods are the coarse fruits and vegetables containing indigestible constituents. It has been found that these foods, even when given in a finely divided state, are irritating, hence they should be eliminated entirely from the solid food list. The physiological irritants are those that act directly on the mucosa producing physiological changes, such as an increased congestion, and with this increased congestion there follow hyperacidity and hypermotility.

Spicy foods with pepper or mustard and other condiments all tend to have this effect. Other physiological irritants are those that act on the secretory cells indirectly and produce an increase in the acid content. Coffee, tea, meat extracts, and certain meats themselves have this tendency. Foods of another class which act differently and cannot be classified as either stimulants or irritants are the fats or fatty foods. These prevent proper rest to the stomach by unduly prolonging the emptying time of the organ.

With a general knowledge of foods that should be prohibited it is a simple enough matter to make out a diet list of foods that are suitable and proper. For the convenience of those who have occasion to treat these cases postoperatively, Levy appends a list of foods arranged in the order of their consistency. These foods have been selected with the one idea uppermost in mind, namely, that none shall be stimulating or irritating to the stomach.

Fluids: Water, whey, strained gruels, lemonade, orangeade, orange juice, plain or malted milk, chicken broth, creamed soups without vegetable masses.

Soft Diet: All foods in the liquid diet, eggs boiled at least three minutes, bread, potatoes (baked, boiled, or mashed), peas,

milk toast, boiled cereals, except oatmeal, such as rice, farina, cream of wheat, hominy, wheatina; puddings, such as bread, rice, tapioca, corn-starch, sago, containing no raisins; custard, ice cream, gelatin preparations, strained jellies, broths containing noodles or rice.

Semisolid: Foods in the above list, and chicken, broiled fish, except salmon and mackerel, cream or pot cheese, macaroni.

It has been his practice in those of his cases operated upon privately to cooperate with the surgeon in the after-care. As a result of this cooperation there have been very few recurrences of symptoms in these cases, and this success has prompted the writing of this paper. He has been convinced from this that by properly following out the above suggestions and recommendations, there is every reason to believe that there will be a reduction in the number of failures following operation in the class of cases mentioned in this paper. As a result of this, greater confidence will be placed in surgical interference for the cure of duodenal and gastric ulcer and for the relief of gastric symptoms in extragastric disease.

Pituitary Polyuria or Diabetes Insipidus.

In *Northwest Medicine* for January, 1921, WINSLOW states that the treatment of diabetes insipidus has hitherto been a failure, except when due to syphilis. Ergot, opium, bromides, valerian, and iodides are hackneyed remedies. Now we have a specific which produces truly dramatic therapeutic results. Medicine has no parallel to it except morphine in relieving pain. But the relief is temporary, and, so far as he has discovered in literature, no recorded case of permanent cure by it has been substantiated. This, *a priori*, might be expected since the underlying cause is not removed by the remedy—the subcutaneous injection of extract of the posterior pituitary lobe.

Pituitrin, surgical, represents both the pars intermedia and the posterior lobe, and

is said to be twice as strong as the obstetric pituitrin. In diabetes insipidus thirst and polyuria disappear miraculously within about half an hour after injection of pituitrin. The urine becomes more concentrated within one-half to two hours. Pallor, a fall in blood-pressure, dilatation of the pupils, and sometimes headache, may also occur, and an immediate desire to defecate. Half a cubic centimeter twice daily is usually more successful in its relief than 1 Cc. once a day. The unfortunate fact exists, however, that pituitrin has usually no therapeutic action given by the mouth. Winslow finds only two writers claiming success from its use—Mazfelt, who says he has obtained good results by feeding fresh beef pituitary gland; and Engelbach, who found one case of polyuria remained well on continued pituitary substance gr. 10-30 t.i.d. by the mouth.

He reports two cases of diabetes insipidus in which treatment with pituitrin gave the most immediate and theatrically favorable results.

Management of Difficult Cases of Infant Feeding and Bronchopneumonia.

In the *Lancet* of January 8, 1921, VINCENT, in considering intestinal disorders in infancy, states that the cases which he discusses are full of difficulty and anxiety. The baby is suffering from diarrhea, is cold, very ill, and a fatal issue is probable unless a stop is put to the threatening conditions. He advises not to concentrate attention too much on the diarrhea. Long ago Holt, in his admirable book "Diseases of Infancy and Childhood," referred to the cases in which constipation occurs, remarking that in acute intestinal intoxication diarrhea is a conservative process of the greatest possible value, and Vincent cordially agrees with him. In 1887, Ballard, reporting upon his investigations into the disease known as "epidemic diarrhea," stated that in his opinion the disease could run its course from first to last, and even to death, without any diarrhea at all. In Vincent's paper on the "Bacteriological

Diagnosis and Treatment of Alimentary Disease in Infancy and Childhood" we will find a fairly complete account of the subject; he now gives only a very brief summary.

The first thing is to give the infant a good dose of castor oil. Stop all food and give warm sweetened weak tea—one of the best sustaining tonics for the infant and, generally speaking, much better than brandy. If the collapse is urgent, administer by inhalation 1 minim of amyl nitrite—the most potent restorative in all cases of infantile collapse and extremely effective in cases of convulsions. He has long abandoned the subcutaneous and intravenous injection of normal saline solution. If the baby cannot swallow, administer amyl nitrite and then give the normal saline by the mouth in a bottle. He has never known a baby to refuse it, and administered in this way it is extremely effective and gets into the baby much more quickly than by any other method. All fluids administered at this period should be at "super temperature," 110°. A direct microscopical examination of the intestinal dejection is of great importance, for, as a rule, this enables us to put the case into one of two groups: (1) Gram-positive organisms dominant—probably a case of lenteric diarrhea; or (2) Gram-negative organisms dominant—a case of intestinal toxemia.

The cases in which the Gram-negative organisms predominate are serious and, roughly, fall into two types of intestinal toxemia: (1) acute, (2) chronic. The acute type is very serious.

The importance of the bacteriological diagnosis in these cases can scarcely be exaggerated, for as long as the Gram-negative organisms are dominant the infant is in danger. He never feels justified in giving a favorable prognosis until he has satisfied himself that this toxic dominance has been obliterated. If the case is a toxic one, fresh milk is essential. Any form of cooked milk or food other than milk handicaps the growth of the lactic organisms and encourages the growth of the toxic organisms. In bad cases of toxemia fresh milk

will not be anything like powerful enough, and cultures of the bacillus lacticus should be administered with every feed.

In the case of lenteric diarrhea the treatment is very different. The Gram-positive organisms are dominant. The dejections are acid—very likely much too acid. In such cases a small dose of opium is a very valuable remedy, as it soothes the irritated intestines. The infant should be kept very warm and should not be given fresh milk until the diarrhea has ceased. In these cases he finds that a good brand of unsweetened condensed milk much diluted is, as a rule, a very good food to begin with. In the course of its preparation it would appear that saccharated lime is added to the milk; this combination appears to be very well suited to the needs of the infant suffering from lenteric diarrhea.

In all cases of serious intestinal disorder the treatment must be conducted with great care. Sometimes the kind of food previously given is so ill-suited to the infant's needs that it must be stopped forthwith. But in other cases the changing of one kind of food to another and very different kind of food is too violent a procedure. For example, he is never satisfied until the infant is getting fresh milk in suitable quality and quantity, but this does not mean that he promptly orders a milk mixture suitable for a normal infant. The worse fed a baby has been the less likely it is to digest milk. The milk mixture must be given much diluted, and at first it should not be given at every feed. The proper food must be gradually introduced, for a delicate infant cannot straightway digest fresh milk after it has been deprived of milk for a considerable period.

Before closing his lecture Vincent referred briefly to a bronchopneumonia and the importance of correct feeding in these cases. The baby has been very ill with all the signs and symptoms of pneumonia, but the temperature has fallen; the breathing is much easier, and altogether it is clear that the severity of the attack has passed. Just at the time, however, that the rapid recovery of the infant is expected it be-

comes clear that something is wrong, and it is very often at this stage of the case that he is called into consultation. These are cases of colon toxemia; the infant has been swallowing large quantities of mucus, and the decomposition of this mucus in the intestine is responsible for the condition. The leading symptoms are apathy, great drowsiness, weakness, and refusal of food. Always feed infants suffering from bronchopneumonia on fresh milk and keep the bowels open, so that the mucus is speedily voided.

A Case of Cardiac Massage.

In the "Memoranda" columns of the *British Medical Journal* of January 8, 1921, COLEMAN states that he thinks it may be interesting to publish notes on the following case; though the treatment was not finally successful, yet the response was so marked as to emphasize the importance of the method:

The patient was a weak, thin man of forty-five to fifty. On August 21, 1920, the operation of gastroenterostomy was being performed for continual pain and vomiting. It was largely completed when the patient stopped breathing. Artificial respiration was performed and breathing very soon started again, but the pulse was very weak. The operation was continued, but in a few minutes breathing stopped again, and the pulse could not be felt. Artificial respiration, strychnine, ether under the skin, hot cloths to the epigastrium were all tried without avail. The gloved hand was inserted in the abdomen through the operation incision and an attempt made to massage the heart through the diaphragm, but the heart could not be felt at all. Finally, after half an hour, during which time there had been no voluntary breathing and no pulse or audible heart sounds, the case appeared quite hopeless. Then direct massage of the heart was tried. Coleman cut through the anterior left fibers of the diaphragm and passed his gloved hand, by means of the abdominal incision, through into the chest cavity. He found the heart

small, flabby, and empty, and quite without movement. He grasped and squeezed it, and kept up continued massage on it, artificial respiration being continued meanwhile. After some considerable time, at least five minutes, the heart began to respond, inasmuch as it became firmer and larger, and on squeezing it empty it automatically filled again. Massage was continued. Shortly after, on ceasing the massage for a brief period, a very small beat, feeling almost like a tremor, continued, but only for a very short time. Pituitrin extract, 1 Cc., was given, and soon after, on ceasing the artificial respiration, the patient took one respiration himself, but did not continue. Again later the heart continued to go for a brief time alone and the patient breathed again. Then he breathed twice in succession, later three times, and so on till he twice breathed automatically nine times consecutively, but did not continue. Also the heart would not keep going for long if the massages were suspended. About a pint and a half of normal saline was injected into a vein in the arm and more pituitrin extract given, but the breathing would not start again. The heart gradually got weaker. It still responded to massage, but would only give one or two beats when left alone, till finally, nearly two hours after breathing first stopped, response failed and the case was given up.

Coleman notes that the heart had given no sign of beating for about half an hour when direct massage was tried. It could not be grasped or moved at all through the diaphragm because it was small, empty, and flabby, and lying against the back of the chest wall. Massage was continued for over an hour, and up to nearly an hour after commencing direct massage there was irregular and non-continuous automatic heart-beating and unaided respiration. This case might have been hopeful had direct massage been employed earlier. It would appear wise in every case of collapse under anesthesia to employ cardiac massage as soon as it is ascertained that the heart has ceased to beat.

Eclampsia and its Conservative Treatment.

In the *Virginia Medical Monthly* for January, 1921, BEAR states that the curative treatment varies with different men, some using medical measures along conservative lines, while others resort to radical operative procedures. The treatment may be divided into four great plans: sedative treatment; measures to reduce blood-pressure; eliminative treatment; and the operative treatment. Results are much better in a hospital than in a home. Veit was the first to advocate the use of morphia in eclampsia. The patient should be isolated in a quiet, semidark room and then treatment instituted. McPherson, of the New York Lying-in Hospital, who formerly was a believer in the surgical treatment, is now a firm supporter of the conservative treatment. The following is his method: blood-pressure is taken and a catheterized specimen of urine is secured. Hypodermic injection of one-half grain morphine is given, the stomach is washed out, two ounces of castor oil is poured down the tube at the end of the lavage, and the patient is given a colonic irrigation of five gallons of 5-per-cent glucose solution.

Venesection is done if the systolic blood-pressure is over 175. He uses one-fourth grain morphine every hour until the respirations drop to eight per minute. He further claims that at this time the convulsions have usually ceased, the patient will have fallen into labor, and will be delivered normally or by an easy low forceps in a short time. In his report two years ago, fifty-five patients were treated by this method with a mortality of only 9 per cent.

No one can secure the best possible results by becoming fanatically attached to a single plan of treatment; no two patients are exactly alike, and frequently certain modifications or added steps must be made to suit the individual case. With reference to venesection, it is best not to bleed them too much, for there may be a considerable loss of blood at the time of delivery and shock may ensue. On the other hand, if no venesection was performed, it is advis-

able to allow the patient to bleed just a little, rather than to check, since bleeding is one of the helpful means of cure. In giving morphine, he uses one-fourth grain every hour until the respirations range between 12 and 15. Other measures which are of extreme importance are catharsis and diaphoresis to produce elimination. Better results follow when the patient is placed under a portable sweat cabinet and subjected to a steam bath, than from the older plan of using the blankets. Croton oil, two minims in a teaspoonful of olive oil and allowed to trickle down the throat, will likewise prove beneficial. In the colonic irrigation, he uses either glucose or sodium bicarbonate, repeating same every four or five hours. Ether or chloroform, if used at all to assist in controlling convulsions, should be given sparingly.

The operative treatment, in case the patient is not delivered, is a question which varies considerably. Statistics show that with eclamptics treated by radical methods, the maternal mortality approaches an average of from 25 to 30 per cent, the fetal mortality 40 to 50 per cent. Several years ago surgical intervention was by far the method of choice. Like everything else the style changes, and at present there is a great tendency toward conservatism. Pains usually begin if the convulsions are at all severe, and labor is often rapid when once begun. Theoretically, there is much to advise the operative delivery of a woman in eclampsia. It is a known fact that the convulsions are due to her condition; it is a common thing to note that after the delivery the convulsions usually clear up.

It would seem, then, that the immediate delivery ought to cut short these seizures, but as a matter of fact it does not always do so; or, if there are no convulsions, the mortality may still be high. Convulsions may reoccur as late as the eighth day. There are many who advise Cæsarian section, vaginal hysterotomy, or accouchement forcé. He does not believe in Cæsarian section, except where eclampsia is complicated by a contracted pelvis or tumor formation. It must be borne in mind that

women in this condition to not stand surgical operations well; we are dealing with a severe toxic and degenerative affair, and with the addition of a general anesthetic they easily succumb to shock. In the preëclampsic type it is well to administer one ounce of castor oil with ten grains of quinine and repeat five grains in three hours. The introduction of a bougie will usually assist in the production of labor.

Bear does contend, however, that if a patient is already in labor with a fair dilatation, it is best to insert a bag or perform manual dilatation and thus hasten delivery; or if with a full dilatation, a mid or low forceps may be employed, the amount of anesthetic, if used, being very small. During the convulsive attacks the patient must be protected against injury by the use of the restraining sheet. A clothes-pin well wrapped placed in the mouth will prevent injury to the tongue.

Adrenalin in Resuscitation from Apparent Death.

In the *British Medical Journal* of January 8, 1921, WALKER states that anesthesia, asphyxia, the passage of a powerful electric current, violent emotion, and violent sensory stimulation may place the body in a state which resembles that of a clock which has been stopped, but not permanently damaged; if the machinery can be restarted it will continue to run automatically. Relatively simple means will often suffice to set things in motion again, as a mere shake will serve to start a clock. Sometimes it appears as though a more accurately fitting stimulus were required, like a swing in time with that of the pendulum.

Welby Fisher, in a very interesting paper, advocated cardiac massage applied through an epigastric incision. He makes no reference to the use of adrenalin. The following notes of a limited experience may be of interest.

Adrenalin applied to the heart muscle acts on the sympathetic neuromuscular junction, and very greatly increases both the excitability of the tissue and the energy

output of the muscular contractions. In some twenty cases of death from various causes, when all signs of life had ceased for several minutes, Walker has injected a minim or two of 1-in-1000 adrenalin chloride directly into the heart muscle. A fine needle was passed through the fifth left intercostal space, just mesial to the lung resonance; the point was directed slightly inward and upward, and could be felt to enter the apex of the heart; when firmly embedded in the muscle the injection was made. Several of these needle tracks were examined post mortem, and in no case did it appear that any drawback would have ensued had the patient survived.

In most of the cases death had occurred as the result of long established disease, and adrenalin was neither expected nor observed to have any effect (a fact not without interest). The following cases are of interest:

A child of eleven months during a circumcision under chloroform had stopped breathing, and became pale and flaccid; the pupils were dilated, no pulse could be felt, and no heart sounds could be heard. Artificial respiration was started, and the heart was massaged by pressing the fingers under the costal margin; in this case the heart could be felt, and almost gripped between the fingers. There was no response, and the body was cooling perceptibly. Adrenalin was injected into the heart muscle, and immediately the heart started beating; shortly after respiration recommenced, and in a few minutes the child appeared normal. The time was not accurately observed, but it is estimated that at least four minutes had elapsed between the stoppage of the pulse and the injection of adrenalin. The anesthetist's estimate is considerably greater. The child was seen at intervals for three or four weeks; not the slightest ill consequence was detected.

A woman of thirty with empyema had just had an exploring needle passed into an intercostal space. Suddenly she became limp and pale, she murmured a word or two, but the sound diminished into silence. She dropped back apparently dead. The

muscles were quite flaccid and motionless, no pulse could be felt nor heart movement heard; jaw and eyes were in the cadaveric position. Artificial respiration was commenced, and adrenalin was sent for. Suddenly the pulse returned, beating strongly under the fingers, the patient flushed, and a few minutes later she was sitting up and talking. She had passed through a Stokes-Adams attack, subsequently repeated. Possibly more detached observation would have detected an auricular pulsation in the jugular veins. Had the adrenalin arrived half a minute sooner a striking success might erroneously have been ascribed to it.

Although this last case shows the need for caution in interpreting results, the other case suggests that injection of adrenalin into the heart muscle may restart it when other means fail.

Conceivably the needle might be pushed on into the cavity of the left ventricle and Ringer's solution containing adrenalin might be run in under pressure through a tube and funnel; on passing through the coronary arteries the adrenalin would be brought much more intimately into contact with the heart muscle, and would reach the excitable sinus node and auriculoventricular bundle. The flow of Ringer's solution, preferably oxygenated, would also supply a temporary artificial circulation. Reports on wounds of the heart suggest that the risks of passing a fine needle through the apex of the heart are small compared with those of the desperate condition in which such means would be used. The method seems sufficiently promising to invite preliminary experiments on animals.

Treatment of Certain Types of Goitre.

In the *Virginia Medical Monthly* for January, 1921, McGUIRE states that rest is the first and most essential factor in the medical treatment of this disease. It should be absolute and complete and must be mental as well as physical. It is useless to try to secure it at home. The patient should be placed in a hospital where he can be under proper control. Means and Aub

studied the effect of rest on a group of cases. These patients had an average metabolic rate of +81 per cent, and after from one to three weeks the same group had an average rate of +67 per cent. In a few of the more toxic cases the curve rose in spite of rest. There was no case in the series whose metabolism was brought to within normal limits by rest alone. After a time a level was usually reached and rest alone did not cause a further drop.

The administration of various drugs with a view to lessen metabolism has been advocated. Of these, hydrobromate of quinine with ergotine, glycocholate of soda and pancreatic extract have the greatest number of advocates. Means and Aub have tested the action of hydrobromate of quinine on a group of patients and found that it had no apparent effect on the metabolic rate of the cases. While it is only of historic interest it may be mentioned that the effect of Beebe's serum on metabolism was also tested and found negative. The administration of digitalis is recommended by Willius, not for its effect on metabolism, but because of its influence on the heart. It is important to have a potent preparation and to prescribe it in sufficiently large doses to obtain the desired result. If it causes nausea by mouth it may be administered by rectum.

Use of the *x*-ray has long been advocated in these cases, and more recently the application of radium has been recommended, the theory being that a sclerosis is produced which lessens glandular activity. The relative merits of *x*-ray and radium have not yet been determined, but it seems that the choice is largely a question of the experience of the operator and the convenience of the patient. Means and Aub tested the effect of the *x*-ray on a group of cases. These patients had an average metabolic rate of +63 per cent. After one or two treatments at intervals of one month, there was a reduction to +52 per cent. After four or five treatments there was a reduction to +40 per cent, and after two or three years' treatment there was a reduction to +13 per

cent and the patients were able to lead normal lives. The advantages claimed for the x -ray method of treatment are that it avoids an operation and is attended by less danger to life. The disadvantages are the increased length of invalidism, the greater difficulty of operating if surgery is ultimately necessary, the possibility of shrinkage of tissues of the neck, danger of myxedema and of x -ray burns, and the liability of treating colloid and cystic goitres which are not benefited.

The injection of boiling water or a solution of quinine and urea into the body of the thyroid has been advised in cases of beginning hyperthyroidism not severe enough to justify operation, and as a preparatory measure to partial thyroidectomy in patients too ill to warrant any form of immediate operative procedure. The theory on which this practice is based is that the destruction of glandular cells and the obstruction of blood-vessels will cut down the output of thyroid secretion. The method has many enthusiastic advocates, who report good results. It is not without immediate or remote disadvantages and dangers. Some patients are so sick that even this apparently simple procedure will cause an acute and perhaps a fatal hyperthyroidism, others will not be benefited and a subsequent surgical operation will be made difficult by the adhesions it has caused, and finally the irritation may eventually result in the development of cancer. Balfour reports 103 cases of malignant disease of the thyroid, and it is a significant fact that seven gave a history of having been treated by the injection method.

It is generally conceded that at present the safest, surest and most satisfactory treatment of hyperthyroidism is by surgery. The practice of destroying a portion of a gland in order to lessen its physiological activity is certainly illogical, and only defensible on the ground that we are confronted with a condition and not a theory. Still it is a fact that while patients are benefited by rest and drugs and sometimes either make spontaneous recoveries or are

cured by repeated and long-continued x -ray or radium treatment, she is given the best chance by an operation, and one should be advised as soon as the diagnosis of the disease can be established by the clinical symptoms, the metabolic rate and the Goetsch test, in order to economize time and avoid the possibility of serious complications.

The operations done for hyperthyroidism are ligations and partial thyroidectomies. The benefits from ligations are marked, but the results are not permanent. Observation in a series of cases at the Mayo clinic showed that ligations reduced the metabolic rate from an average of +57 per cent before operation to an average of +39 per cent three months after operation, and there was also a corresponding improvement in clinical symptoms and an average gain of 21 pounds in weight. Experience has proved, however, that sooner or later there will almost invariably be a relapse and the patient's condition become worse than before. Ligations, therefore, are not relied on to effect a cure, but are employed either as a test of a patient's reaction to trauma in cases in which there is no doubt of the individual's ability to stand a thyroidectomy, or as a means to get a patient in condition for a more radical operation when it is obvious that at the time a thyroidectomy could not be done without great hazard.

The results of partial thyroidectomies are prompt and permanent. If the operation does not effect a satisfactory cure, it is because either not enough of the gland has been removed or the operation has been delayed until the patient's symptoms are no longer due to hyperthyroidism alone but to organic changes in the vital organs as well. Means and Aub found in a group of cases that the average metabolic rate was 46 per cent before thyroidectomy, and during the first two weeks after the operation there was a fall to +21 per cent. Then came a secondary rise which continued until the fourth month, but in the third year the average rate was +13 per cent and the patients were leading normal lives. To get the best

results it is necessary to remove all of one lobe, the isthmus, and a large portion of the other lobe. Acute postoperative hyperthyroidism, which is the greatest danger of the operation, is not due as much to the amount of the gland taken out as it is to the amount of the gland left in. When it develops to a dangerous degree, the treatment advised by Crile of packing the patient in ice will be found most efficacious.

Medical Drainage of the Biliary Tract.

The *British Medical Journal* of January 8, 1921, in an editorial on this subject, states that by a happy combination of ideas derived from S. J. Meltzer's physiological observations on the one hand, with the use of Einhorn's duodenal tube on the other hand, Lyon of Philadelphia has during the last three years worked out a method of draining the bile ducts and gall-bladder which has already given excellent results in the diagnosis, prevention, and treatment of biliary disease, and gives promise of far-reaching importance. In 1917 Meltzer formulated his conception of contrary innervation as applied to the filling and emptying of the gall-bladder; Oddi's sphincter at the lower end of the common bile duct and the musculature of the gall-bladder are supplied with inhibitory and motor fibers from the splanchnic and vagus nerves, which act antagonistically to each other, so that when the sphincter is relaxed the gall-bladder contracts, and *vice versa*. He also showed that the application of a solution of magnesium sulphate to the mucous membrane of the duodenum was followed by relaxation of Oddi's sphincter, a result which was not produced when the salt was taken by the mouth. His hint that this observation should be utilized in human disease has been acted on by Lyon, who has published a series of papers containing observations and suggestions of great importance for future developments in medical and, indeed, in surgical practice.

Lyon believes that the application of magnesium sulphate to the duodenal mucosa induces contraction of the gall-bladder, and

that incision of the gall-bladder or disease of its walls removes the normal antagonistic action of the gall-bladder and Oddi's sphincter, so that bile then runs continuously into the duodenum. The technique of the introduction of the duodenal tube is too long to quote; but it may be mentioned that the patient is examined twelve hours after a meal, contamination of the duodenal contents from the mouth and stomach being obviated by frequent washings; when the tube has entered the duodenum 75 Cc. of a 33-per-cent solution of magnesium sulphate is introduced, and the contents are then gently aspirated. In health the first bile thus obtained is of a light yellow-golden color, and comes from the common bile duct; after a short time the bile suddenly changes to a darker golden yellow, and becomes more viscid and larger in quantity; this bile is regarded as coming from the gall-bladder; later bile of a lemon color, thinner and more limpid than the other two, follows and is believed to be that freshly secreted by the liver. The normal gall-bladder contains $1\frac{1}{2}$ to $2\frac{1}{2}$ ounces of bile, but in stasis or atony of the gall-bladder as much as six ounces may be obtained, provided, of course, that the cystic duct is patent.

The characters of the bile change as the result of biliary infections, and comparison of the three samples, which can be separated into different bottles, will indicate what part—the gall-bladder or common bile duct—is infected or mainly involved. Chemical, microscopical, and bacteriological examination of the bile can thus provide an early diagnosis; and as Brown points out in a recent article on "The Meltzer-Lyon Method in the Diagnosis of Infections of the Biliary tract," early cholecystitis can be detected at a stage when the clinical manifestations—indigestion and minor colic—are vague, and the gall-bladder does not show any thickening or color changes to the naked eye, so that bacteriological examination of the aspirated bile provides the surgeon with data he might fail to obtain from an exploratory laparotomy.

When more than two and a half ounces of gall-bladder bile is obtained by aspiration, the diagnosis of stasis is justified, and by means of repeated aspirations this condition, which is of such importance in favoring infection and cholelithiasis, can be obviated. In cholelithiasis the bile may convey a gritty feeling to the finger, and microscopically show clustered masses of precipitated bile salts or pigment; on one occasion small concretions were aspirated through the tube, and several times calculi too large to be recovered by the tube were passed by the bowel after aspiration. Treatment of simple catarrhal jaundice by repeated aspiration of bile and subsequent disinfection with permanganate or silver nitrate solution diminished the duration of the disease by one-half, and probably minimized the risk of sequels. This method is not only of use in the treatment of early inflammations of the gall-bladder and bile ducts, but may be valuable in infections persisting or recurring after operation. Further, there is wide scope for investigation on the lines opened up by this method, on the action of cholagogues, on the early stages of biliary stasis, on the so-called functional disorders of the liver, and on the changes in the pancreatic juice.

Recovery from Fifteen Grains of Cocaine by the Mouth.

The *Illinois Medical Journal* for January, 1921, in commenting on this subject, states that Bonjour of Lausanne reported in the *Revue médicale de la Suisse romande* for June, 1920, xli, 6, the case of a homosexual man aged twenty-five, who out of spite against some person not named swallowed the contents of a gramme bottle of cocaine. As he was employed in a laboratory there was no trouble in getting the drug. The dose was swallowed at 11 P.M. During the night there was total insomnia and mild agitation with diminution of general sensibility, both superficial and deep. The lower extremities had a dead feeling. At 8 A.M. he was weak and ill and summoned the author. Two hours later he dressed and

went to his office. The symptoms were remarkably mild, the pulse being apparently normal. There was no elevation of blood-pressure from vasoconstriction; there was no "cocaine jag" and no increased reflex activity such as is common among snuffers. There had been no convulsive stage with subsequent motor paralysis. The sole symptoms were agitation and hypesthesia. There was no irregularity of the pulse, no ultimate lowering of tension; in fact, the symptoms agreed with those which follow the ingestion of small doses.

The Modern Treatment of Acne.

In the *New York Medical Journal* of January 22, 1921, HIGHMAN states that the underlying causes of the disease are probably associated with the profound changes inherent in puberty. Inasmuch as puberty cannot be hurried or modified by treatment, the main hope of therapy lies in an attempt to alter the skin so that the predisposing factors become unable to do any great damage. It is necessary, before continuing, to state that the formation of pustules is incidental, the comedones acting as foreign bodies which make it possible for the bacteria in the follicles to become active. Thus the indications for treatment are twofold: First, the prevention of comedone formation; second, the control of the underlying factors, where this is possible. Incidental indications are the treatment of the scalp and the expression of the pustules and comedones.

The general treatment consists of regulating the diet by cutting down the starch and sugar intake and by promoting intestinal function. The latter is best accomplished by eating green vegetables and stewed fruits, together with the judicious use of cathartics, if indicated. If there should be disturbance of the internal generative organs, a condition rarely found in the young, this should be controlled. In dieting patients, however, it is extremely important to keep up the general nutrition and weight.

The most important indication in local treatment is to prevent comedone formation. If this can be accomplished, pustules will not develop and the disease will be automatically controlled, even though the predisposing causes are not, for acne cannot occur where the skin is normal and the sebaceous glands are not overactive. In former days this was done with moderate success by the use of sulphur, resorcin, or salicylic acid in lotions or creams. These substances make the skin peel and tend to overcome the condition favoring acne. Today this may be accomplished more certainly and more precisely by the use of the x -rays in given amounts. One Holzknecht unit applied to the face weekly, for from ten to sixteen exposures, will cure the average case of acne, and if from time to time there should be recurrences, these will yield readily to two or three exposures. The x -rays work by diminishing the function of the skin glands and by diminishing exfoliation. Conservatively stated, nine cases out of ten can be cured in this fashion.

Thus it is possible to start treatment when acne first appears and before any real damage has been done to the skin. No local treatment is necessary at home. This eliminates the expense and the loss of time that the purchase and application of drugs involves. In other words, about six minutes weekly in a physician's office for from ten to sixteen weeks will accomplish more than older methods could ever do.

The cosmetic result is enhanced by skilful expression of the comedones and pustules, and the incidence of recurrences is reduced by the use of mild antiseptic lotions to the scalp. The employment of vaccines, so far as his experience goes, promises nothing, for, as already stated, the pustules are purely incidental and will not develop unless comedones are present. It goes without saying that the general treatment should not be neglected, for, after all, the disease is a local manifestation of a general disturbance, and more permanent results are secured by bearing this fact in mind. Nevertheless, without the local disturbance, the general

derangement is incapable of producing acne, so that the major indication is the treatment of the skin.

In addition to the foregoing, the patient should wash the face with a rich lather twice a day and shampoo once a week with some simple soap. Green soap is contraindicated. Recurrences take place in about one case in four, and are easy to control with two or three x -ray exposures. This line of treatment was unsuccessful in only three instances out of fifty, and in one of these patients there was a marked secondary anemia. Such exceptions are indeed rare, and as compared with other methods of treatment, the precise one outlined removes acne from the group of the serious disturbances of youth.

The Treatment of Pernicious Anemia by Splenectomy.

In the *Journal of the American Medical Association* of January 29, 1921, GRIFFIN and SZLAPKA, in their conclusions, state that their review concerns fifty patients with pernicious anemia for which splenectomy was performed. All were operated on more than three years ago. The operative mortality was 6 per cent. Ten patients (21.3 per cent) of those who recovered from operation survived splenectomy three years or longer. Five patients (10.6 per cent) of those who recovered from operation have survived splenectomy more than four and one-half years and are still living. The total length of history of these five patients averages almost six years. It may be stated with reasonable accuracy that, in addition to the immediate remission which occurred constantly following splenectomy, splenectomy prolonged life in at least 20 per cent of their cases.

The authors cannot satisfy themselves that any particular preoperative characteristics of the disease are indicative of favorable results following splenectomy. However, in the type of case in which there is evidence of active hemolysis, the patient shows a more marked immediate improvement. They believe that splenectomy may

be recommended in pernicious anemia when, in view of all the circumstances, personal as well as medical, the possibility of the prolongation of life appeals to the family and to the patient. Occasionally the operation may be performed in order to bring about an immediate remission.

Treatment of Pregnant Females Suffering from Malarial Fever.

In the *Indian Medical Gazette* for December, 1920, MOJUMDAR states that having been placed in a highly malarial station for over four years, and having had to treat more than 30,000 malarial patients, including some pregnant females, he submits to the profession the result of his experiences.

Pregnant females invariably get uterine contractions (especially if the pregnancy is advanced) when they have high fever, and as quinine has the disadvantage of inducing uterine contractions as well, the use of quinine has an obvious risk. But it must be borne in mind that quinine is the only remedy that will control malarial fever, and if high fever persists unchecked, that itself will bring about abortion and may lead to more serious consequences as well.

So the ideal treatment is not to withhold quinine, but to give it in a dose sufficient to kill parasites, but not sufficient to bring about violent uterine contractions.

The question arises, therefore, what is the minimum dose that will control fever? He thinks, if properly absorbed, 10 grains in twenty-four hours—repeated if necessary—is sufficient for benign cases, and for bad and pernicious cases the dose is proportionately higher—*e.g.*, for cerebral cases big doses of quinine are necessary, and in such cases the mother's life is so much in danger that the question of abortion does not arise at all, and so such conditions are left out of our present consideration.

In this connection he lays special stress on the necessity of insuring absorption of the quinine given, for, with a bad abdominal condition and sluggish liver, so little of it will be absorbed that it is preferable to inject it intramuscularly.

He then follows these procedures:

1. When the fever is chronic—*i.e.*, going on for some length of time, with a rise to 100° or so in the evening and no uterine contractions—he opens the bowels with some mild aperient, such as sodium sulphate or castor oil, and then gives quinine bihydrochloride, 3 grains, every six hours, until the temperature is fully controlled. If there is any tendency to uterine contractions, he prescribes a mixture to be given alternately with quinine—containing bromides, viburnum, and hyoscyamus.

When the temperature is controlled, he continues quinine in smaller doses with iron and arsenic for some length of time.

2. When the temperature is high, 104° or 105°, and there are probably uterine contractions with it, he considers the condition anxious. He reduces the temperature with hydrotherapy and prescribes uterine sedatives. If he decides on giving morphia, he injects $\frac{1}{3}$ grain or so. In favorable cases, as the temperature comes down, the uterine contractions also quiet down. He injects deep into the gluteals 10 grains (and not less than 7½ grains unless there are special contraindications) of quinine bihydrobromide. He always insists on the thorough massage of the muscle to diffuse the fluid through as wide an area as possible, and that always prevents lumps and painful buttocks.

This injection generally postpones the second paroxysm sufficiently to make it possible to inject another 5 grains of quinine twelve hours after, and in fortunate cases two injections suffice to control the temperature, and then more quinine may be given by mouth. In less lucky cases the same procedure is repeated—quinine being injected during the period of remission until the temperature is controlled.

3. For more serious cases, he repeats again, the life of the mother is so much in danger that the safety of the fetus becomes a secondary consideration, and if quinine given in small doses does not control the fever, it must be pushed in larger doses until the physiological action is produced.

The Management of Breech Presentation.

In the *New York Medical Journal* of January 29, 1921, PFEIFFER reaches these conclusions:

1. Breech may be corrected oftener than commonly supposed and external version should be attempted, unless the etiology makes this impossible.

2. There is a definite mechanism for buttocks, shoulders, and head, with spontaneous delivery. Hence, until positive indications arise in either the mother or the child, interference is not only meddlesome, but dangerous, as it may make a difficult case of a simple one, seriously endangering the life of the child.

3. Of importance in the management of spontaneous delivery of breech are a fully dilated os and a well stretched floor. In breech extractions this importance is strongly accentuated.

4. A proper assistant in all cases is urged, as expression is better than traction.

5. Cæsarian section occasionally may be necessary, but this is because of associated anomalies rather than the breech presentation.

The Reduction of Blood-pressure in Eclampsia.

The *New York Medical Journal* of January 29, 1921, in an editorial on this subject, points out that high blood-pressure in eclampsia is a dangerous complication, and therefore it is of value to know the most effective and safest means for reducing it. At a meeting of the British Royal Society of Medicine held on December second last, Hingston read a paper on the subject in which he related his experience in the treatment of this condition at the Government Maternity Hospital, Madras. He stated that at this institution two thousand women were confined and about thirty cases of eclampsia were seen every year. He was of the opinion that the blood-pressure should be kept down to 120 mm. or less, not only in all cases of eclampsia, but in all

cases of labor with premonitory symptoms of eclampsia. Moreover, he felt certain that the blood-pressure rose after delivery in a certain number of patients who had shown symptoms of eclampsia up to the time of or during delivery, and in other cases in which no signs or symptoms had manifested themselves before and during delivery. Consequently, he held the view that it was essential to watch all cases after delivery and to reduce blood-pressure to 120 mm., whenever it rose above that after delivery.

As to the best and safest method of achieving this object, Hingston believed that the most effective mode, if the os was less than four-fifths dilated, was to bleed the patient until the blood-pressure fell to 120 mm.; when the os was four-fifths dilated he recommended the reduction of the pressure by immediate delivery. If it rose after delivery venesection to reduce it should also be practiced, and this procedure might have to be repeated two or three times. At the Madras Government Maternity Hospital, the largest gynecological and maternity clinic in the British Empire outside the British Isles, this method of reducing blood-pressure had been practiced during a period of three years. The cases thus treated yielded more satisfactory results than those obtained formerly when other methods were in vogue. The mortality was very small indeed, less than two per cent.

According to Hingston more radical measures, such as accouchement forcé and Cæsarian section, are not called for. These measures assuredly reduce blood-pressure, but he yet upholds venesection. In the majority of cases this procedure stopped or lessened the frequency of the convulsions, lowered the blood-pressure to 120 or less if required, prevented rises in temperature and serious lung complications. A considerable proportion of the patients became less drowsy and in some instances passed rapidly from a deeply comatose to a semiconscious condition, and all were less irritable. It was likewise his practice to reduce the temperature if it rose above 100° F.

All those who took part in the discussion disagreed with Hingston as to the good effects of venesection. Mr. Aleck Bourne gave it as the result of his experience that expectant treatment with starvation, elimination and veratrone often obviated the need for Cæsarian section. Donaldson pointed out that there was probably a protective mechanism in these cases to keep the blood-pressure high and thus help the kidneys to eliminate toxins, and he doubted the wisdom of attempting to lower blood-pressure. He believed in treatment by Cæsarian section. Luker agreed with Donaldson. The injection of saline after bleeding might sound paradoxical, but the latter

washed out the poison and acted as a diuretic. The main object was to remove the poison, and the best way to achieve this was delivery by Cæsarian section, followed by saline.

Thus it would seem that British expert opinion is not in favor of venesection as a means of reducing blood-pressure in eclampsia. Of course, venesection is lowering, and repeated venesection reduces the amount of blood when it can be least spared. It is an important question, and the opinions of some of our obstetricians with respect to the most sane and safe way of reducing blood-pressure in eclampsia would be valuable.

Surgical and Genito-Urinary Therapeutics

Cholecystectomy with Modified Drainage.

MAYO (Charles) (*Minnesota Medicine*, January, 1921) notes that the opening of the gall-duct, which also delivers the pancreatic secretion, is usually located beneath an overhanging fold of mucous membrane in the duodenum and is thereby well protected. The little terminal opening is surrounded by the muscle ring of Oddi, which keeps it closed, and which should serve to equalize the tension of bile in the ducts and gall-bladder as opposed to the hepatic circulation producing it. The sphincter of Oddi is stronger in animals that have gall-bladders than in those without them, according to Mann. The gall-bladder in health has a capacity for temporary storage of several ounces of bile, and rhythmic contractions stimulated by the contents of the gall-bladder and ducts occur, causing such delivery as is common to the ducts, the ureters, and the small intestine. Their contraction readily overcomes this muscularly closed outlet, and the peculiar manner in which nature delivers a duct into a viscus by passing it partly through the wall, then continuing between the outer wall and

the mucous membrane, so that internal pressure closes by compression from within but does not interfere with peristaltic delivery through the duct, is true of the common duct; under normal conditions it prevents back flow. This also is true of the little ducts delivering from the lobules of the pancreas into the main pancreatic ducts, not directly at right angles, but on a slant so that internal pressure tends to close them, undoubtedly a provision of nature to prevent the possible irritative effects of chemically changed bile in obstruction from entering the small pancreatic ducts.

Rosenow's investigations were based on the theory that the infection is carried through the blood stream, even in the tissues closely associated in function or connected by ducts—in other words, the specificity of localization of bacteria, which is now commonly accepted. It is probable that the chemical effects of bacteria and stasis of the gall-bladder cause the development of stones, the materials for which are taken from the blood stream, although it must be admitted that the same materials are also present in bile.

Specific destruction of tissues by toxic

agents has long been known; recent experiments of Mann are most illuminating in showing the chemical effects of non-toxic drugs acting through the blood stream, being wholly selective in their effects on the gall-bladder. Mann has shown that Carrel-Dakin solution injected intravenously into dogs in amounts from 5 to 10 Cc. to each kilogramme produces selective changes in the circulation of the gall-bladder and destruction of that viscus, varying according to the quantity of solution used.

The increased cholesterol content of blood during pregnancy undoubtedly contributes to the higher percentage of women affected by cholecystitis with stones; the ratio is about 77 per cent in females to 23 per cent in males. Approximately 90 per cent of the women have borne children and have had the first attack in close relation to a pregnancy. It is of interest to note that cholecystitis without stones occurs in women twice as often as in men.

A general knowledge of the pancreas and its diseases is very essential in the diagnosis of the diseases of the upper abdomen. In the majority of instances the condition of the pancreas, even in tumor formation, is overlooked unless the changes are gross, and mild derangements of function are often attributed to obstruction or disease of the liver. To be sure the condition of the pancreas is usually secondary to an infection involving the structure of the gall-bladder, and although the infection may be brought through the continuity of tissues involved, through the duct itself, or through the lymphatics surrounding it, experimental evidence indicates that the pancreas too is probably more commonly affected through the blood stream. Of the 1254 patients seen at the Clinic with gall-stones and cholecystitis during the last year 339 showed changes in the pancreas so marked as to be recognized clinically.

Cholecystostomy is now reserved for the special case in which advanced age or complications make it desirable; 3346 cholecystostomies have been performed at the Clinic from January, 1907, to August, 1920.

Cholecystectomy with local peritoneal drainage has been the rule, but it is now used for gross infections, without biliary drainage, although biliary drainage is still provided for in most cases of common-duct disease, closure being made in suitable cases without biliary drainage but with peritoneal drainage.

In cholecystectomy a right oblique incision is made. The writer prefers to slant gradually through the vertical lines of muscle fibers, so that a firmer union of continuously divided muscle may be secured than by a split muscle incision; however, there are many incisions which will serve. Occasionally a gall-bladder is placed deep beneath the liver and under its costal margin. Then the liver may be forced toward the midline by packing a large gauze square over the top and to the right of the organ. This maneuver of Masson brings the gall-bladder directly into the exposed field and greatly facilitates the operation. Large distended and necessarily obstructive gall-bladders are at times emptied by a trocar, and in acute inflammations may then be split from top to bottom. The mucous membrane in such conditions readily peels from the connective tissue on the surface of the liver. Bleeding is usually very slight; if it is at all sharp the separation has gone unnecessarily deep beneath the connective tissue on to the liver; the bleeding may be controlled by a temporary hot pack. The anterior portion of the gall-bladder is completely cut away and the duct closed by suture. As a rule gall-bladders are removed intact without being opened. The cystic duct is isolated, clamped between two forceps, and divided, the cut ends of the duct exposed being touched with tincture of iodine and double ligated. The cystic artery is then caught and ligated. The distal end of the cystic duct is drawn up, and with blunt-pointed dissecting scissors the gall-bladder is separated from the liver from below upward. This procedure prevents, to a great extent, the possibility of injury of the common or hepatic duct. The greatest danger,

however, is accidental division and loss of the cystic artery during operation. Variations in the ducts and in the origin of the cystic artery lead to such accidents.

The papers of Brewer, Ruge, Gosset, and Eisendrath describing such variations are well worthy of perusal. The surface peritoneum of the gall-bladder which is left at its attachment to the liver furnishes an easily sutured field. An interlocking catgut suture closes the raw surface down to the ligated cystic duct. The needle with suture is now passed alternately into the right border of the gastrocolic omentum and the right border of the gastrohepatic omentum with an occasional catch into the fatty round ligament to include it in the suture. This fatty apron shuts the stomach, pylorus, and duodenum off from possible fixation to the liver through adhesive attachment. If drainage is indicated it is between the liver and the fat and not between the liver and the pylorus. More and more Mayo is closing the abdomen without drainage, in only a few instances satisfying his old inclination to drain by leaving the double strand of catgut attached to the liver, where the gall-bladder fundus was separated from it, and continued in a suture down to the cystic duct. This catgut is brought out of the abdomen, but the abdomen (peritoneum, muscle, fascia, and skin) is closed tightly around it. Should there be any indication within a few days of a retained secretion, forceps may be passed along the strand of catgut into the abdomen, as any drainage would have followed the catgut suture line to the abdominal wall. If by the fourth day the catgut is not required it is placed under slight tension and cut beneath the skin. This method of cholecystectomy with complete closure of the abdomen has reduced very largely the danger of hernia which was not infrequent in the old days of drainage, whether of bile or peritoneal exudate.

Failure to cure may be due to age or to associated disease. Therefore a careful general examination is required before operation; and with the abdomen open

exploration should be made to determine the presence of other disease. The appendix may be the original focus. A diseased pancreas may be the cause of future colic even after the gall-bladder is removed; consequently the condition of the pancreas should always be stated in the operative records.

The percentage of cures following operations on the gall-bladder varies; some patients with colic from stone consider themselves cured if relieved of the colic. A definite cure occurs in approximately 60 per cent, great improvement in 30 per cent, and 10 per cent have less improvement because of the extent of the disease or complications.

The diseased gall-bladder should be treated by cholecystectomy as a rule, its drainage being required under special conditions. Abdominal biliary drainage is not indicated except in complications. Abdominal drainage is indicated only in conditions in which it would be used in the surgical treatment of other abdominal disease in which infection is present or has been present.

Mastoidectomy Under Local Anesthesia.

DUNLAP basing his conclusions on an experience in twenty-five acute mastoids operated on in the past three years under local anesthesia (*The Journal-Lancet*, Jan. 15, 1921) gives the history of a case in which the patient apparently enjoyed the procedure. "The Doctor slept during his operation and asked several times if he was still at work."

The only complication which he has encountered in twenty-five simple, local mastoids was one where a 10-per-cent cocaine solution was furnished instead of a 1/10 of 1 per cent solution; 12 Cc. of this, or 18 grains of cocaine hydrochloride, were injected before the error was noticed. Immediate incision to release the fluid injected and no attempt to stop bleeding prevented any untoward results.

The periosteum is a sensitive structure,

even under normal conditions. The bone receives a sensory nerve supply from the periosteum, and if the latter is completely separated or rendered insensitive, bone in this location and its entire cross-section become absolutely insensitive. Muscle, *per se*, is insensitive, but sensory nerve tracts pass through connective tissue septa of the muscle bundles. Infiltration anesthesia by contact of 1-per-cent novocaine and five drops of 1-to-1000 adrenalin solution per ounce induces satisfactory anesthesia. The injection is begun by endemic infiltration of wheals and the needle placed into the anesthetic edge of successive wheals. For each centimeter of incision about 1 Cc. of fluid is used.

Neuman injects beneath the upper wall of the external auditory canal, and the fluid passes under the drum membrane and the mucosa of the tympanic cavity. The author has found this unnecessary. The canal is anesthetized by drawing the ear forward and inserting the needle just behind the ear along the anterior surface of the mastoid process. For simple mastoidectomy, infiltration of the soft parts is sufficient. This excludes all operative, but not psychic, stimuli. The circular anesthesia of Hackenbrach, circumscribing the operative field with the anesthetic solution so that all nerve supply to this part will be interrupted, has not been found necessary, the infiltration anesthesia, due to contact with sensory elements, being sufficient to cause complete break in all conductions. Novocaine causes no irritation to the most delicate tissues, is of zero toxicity, its action is more profound, and the duration is increased by adrenalin, minimis 5 per ounce.

Mastoidectomy may be classed as a serious operation. Every effort should be made to conserve the remaining resources of the already crippled patient and aid him to make an uncomplicated recovery. A large percentage of mastoid surgery may be accomplished under local anesthesia more safely and with greater comfort to the patient than with the use of general anesthesia. It is not a surgical stunt to be

attempted only by "local anesthesia gymnasts," but a sane routine procedure requiring no special equipment and with simple but careful technique. The patient approaches operation with a normal amount of fluids in his system, and avoids the dreaded general anesthesia with its disagreeableness, depression, and bad after-effects.

Goldstein, in the army, resorted to local anesthesia because constant presence of atmospheric infection and the frequency of active pneumonia presented many risks in major operations under protracted general anesthesia. He discusses local anesthesia as a possible regular and routine procedure, using any 10-Cc. syringe, 1-per-cent novocaine in sterile distilled water with the addition of five drops of adrenalin per ounce. He colored his cocaine solution with methylene blue, to avoid mistakes of solution. The subcutaneous injection is made from the base of the zygoma down to the mastoid tip, injecting a region one inch from the insertion of the ear. Deep injections are made by plunging the slanting needle down to the mastoid bone, thus getting beneath the periosteum and the mastoid muscle. The usual sweeping incision is made from the zygomatic line to the mastoid tip and down to the bone, and the operation proceeded with in the usual way, being careful of the posterior canal wall, which is quite tender unless injected. If it is injected there may be some swelling for twenty-four hours. Thus a procedure has been worked out independently, by various workers, practically the same, with a minimum of pain and risk to the patient's health, no mortality, and no wound slough.

Operation for Renal Calculi.

HOWARD KELLY (*New York Medical Journal*, Jan. 1, 1921), after outlining the development of renal surgery as applied to the removal of stones, discusses this topic. He excludes from consideration massive and extensive branching calculi, where there is nothing to be done but excise the

kidney, when its function is wholly in abeyance, or at most to incise it from end to end in the effort to remove the calculus without extensive tearing of the tissues.

With due care the wax tip is both certain and satisfactory, and Kelly still uses it, while using the *x*-ray also.

After resorting extensively to pyelotomy, drawing especial attention to the necessity of preserving the fibrous sheath investing the pelvis of the kidney, described by Mayo (W. J.) and himself, he has finally worked out an operation which at first blush is an apparent return to the former crude plan of splitting open the kidney. This procedure is accompanied with a minimal and usually insignificant trauma, as yet with no serious hemorrhage; it is rapid in its execution, and usually avoids any urinary leakage, such as was not infrequent under older methods.

The best incision is through the posterior superior lumbar triangle. In many cases he pulls the tissues widely open with a blunt dissection, thus securing enough room to introduce four or five fingers, the whole hand. After breaking through Gerota's capsules, by simple traction with forceps on the perirenal fat it is often possible to draw the entire kidney out onto the surface. Whether it comes out in this way, or whether it has to be detached by gentle manipulations on all sides, separating it particularly in its upper pole in most cases, it is displaced onto the loin without the slightest damage, and dealt with there in the succeeding stage. Often, however, knowing exactly the position of the stone, he operates upon the kidney *in situ*, and makes a direct opening into its lower pole, or again simply frees and tilts down the upper pole, so as to bring it within reach for the extraction of the calculus. In either case, whether treated *in situ* or outside, the operator gently palpates the kidney between the thumb and fingers, including the renal pelvis, to see whether the stone can be felt and located. If it is found it can then be thrust up toward the dorsum with the fingers to facilitate the

enucleation. If it is not so located, then with the *x*-ray plate before him as a guide the next step is to take a fine needle about 6 cm. in length, fastened in a cork, and to thrust this into the kidney, where it is expected the stone will be found. Once the needle touches the stone, it is left *in situ*, while a small incision (averaging about 2 cm. in length, but varying with the size of the stone) is made through the renal capsule. An instrument is then taken in hand which is neither blunt nor sharp, and which can be pressed against the finger without cutting it. This is driven through the renal substance down to the stone. A narrow pair of forceps is then inserted and the stone caught and extracted.

If the removal is clean and clear, and there is only a mild infection, Kelly closes the wound entirely with one or two mattress sutures; as the bleeding is usually minimal, a single catgut mattress suture may suffice. The external abdominal wound is then closed with a small drain. Sometimes it is an advantage, if the stone is a little large, to carry the scissors into the pelvis until the stone is touched, and on withdrawing to open them a little, thus enlarging the opening in a blunt way.

Surgical Treatment for Cerebral Hemorrhage in the New-born.

STRACHAUER (*Minnesota Medicine*, December, 1920) calls attention to the importance of cerebral hemorrhage and its neglected treatment. It is the cause of death in over 50 per cent of the infants, still-born or dying within the first week of life at the University Hospital. Its frequent occurrence without death is attested to by the thousands of cases of mental deficiency, spastic palsies, epilepsy, blindness, and varying degrees of amentia. The early recognition and the prompt institution of appropriate treatment will prevent many of these deaths and, much more important, avoid the sad sequels of cerebral hemorrhage.

The etiology of cerebral hemorrhage of

the new-born is complex. Incident to the trauma of parturition, the molding of the head, the overlapping of the parietal bones, or the occipitals under the parietals, the blood-vessels of the brain may be torn. Excessive trauma may even cause laceration of the large veins and sinuses, with prompt death. Spontaneous rupture of the delicate vessels may occur in the cerebral congestion of asphyxia neonatorum. Cerebral hemorrhage occurs as frequently in normal, precipitate, and even premature births as after stormy labors. Cerebral blood-clots have been found before birth. Hence there are causative factors to be considered other than those of trauma. The majority of cases are caused by a combination of the normal trauma incident to childbirth and a phase of the so-called hemorrhagic diseases of the new-born. Rodda in his work on the coagulation and bleeding times of blood in the new-born has shown that "there is a prolongation of coagulation and bleeding times from the first to a maximum on the fifth day of life, with a return to the average first-day determination time before the tenth day. It is significant that this coincides with the age incidence of hemorrhagic disease and cerebral hemorrhage." This normal prolongation of the coagulation and bleeding times makes it difficult for nature to control the hemorrhage incident to the traumatic rupture of the delicate cortical vessels. The blood-clot in the vessels is soft and easily disturbed. When the coagulation and bleeding times are abnormally and greatly prolonged, as in the condition of hemorrhagic disease of the new-born, the oozing or bleeding continues, causing increased intracranial pressure, convulsions, and death. If the infant survives, the after-results of the increased intracranial pressure and cerebral degeneration manifest themselves promptly, or slowly in the course of months.

The hemorrhage may be supratentorial, infratentorial, or intraventricular — the blood coming from the longitudinal sinus or its tributary system, the transverse sinus, or the vessels leading to it, or the choroid plexus respectively. It may come from a

torn tentorium. The hemorrhage is most commonly cerebral and unilateral, the blood coming from the delicate cortical vessels. The blood may clot or remain fluid. Among eighteen autopsies upon cases of cerebral hemorrhage at the University Hospital by Dr. Warwick, there was no instance of gross hemorrhage into the brain substance.

The history of the births, while important, shows in the majority of the cases normal and non-instrumental deliveries. The birth may even be precipitate. Various degrees of asphyxia neonatorum and delayed spontaneous respiration are common. The respiration when established is frequently slow, shallow, and irregular. The pulse is slow in the moderate degree of compression, and rapid when medullary paralysis is imminent. Inequalities of the pupils and ocular palsies may be present. Hyperactivity of the reflexes, the child starting and twitching in response to mild or normal stimuli, with the development of spasticities, and focal or general convulsions, are characteristic. Examination of the fontanelle may disclose a distention, a tenseness at times of board-like degree, or actual bulging, with loss of pulsation. The sutures may be separated and the veins of the eyelids and forehead prominent and dilated. The infant may be languid, apathetic, and have difficulty in swallowing. Disinclination or inability to suckle is common. The delivery may be normal or stormy and a slow cerebral hemorrhage be present, not manifesting itself until after several days with the gradual development of cerebral compression. The symptoms may be mild, with perhaps a convulsion or two, and the child seemingly spontaneously recover. Later observation discloses the lack of mental development—the spasticities, deafness, and blindness; or epilepsy may develop from adhesions, scar, cysts, and so forth, depending upon the location and extent of the hemorrhage.

The coagulation time of the blood and bleeding time will be found prolonged in the majority of the cases. This information is most important, and with Rodda's simple method should become a routine

estimation in the new-born. When both times are greatly prolonged, hemorrhage can be anticipated and prophylactic injections of blood made or transfusion be performed. The hemorrhagic tendency should be controlled, and evidence of hemorrhage most assiduously watched for.

A spinal puncture is to be performed, and spinal manometer readings may be made. In the infratentorial hemorrhage, blood under various degrees of pressure may be obtained. In the supratentorial cases microscopic blood may be present in the spinal fluid, but the finding is not reliable. Zanthochromia should be tested for; when positive it points to hemorrhage, about the base of brain or upper cord region.

Prolonged coagulation and bleeding times call for the injection or transfusion of blood. Repetition is guided by the blood findings. In the slow bleeding cases this treatment may be preventive and suffice. The shortening of the coagulation and bleeding time in severe hemorrhages is absolutely essential to successful surgical intervention.

In the infratentorial cases spinal puncture or punctures may be performed. As much as 60-80 Cc. of blood may be removed at a time, the tenseness of the fontanelle subsides, and prompt relief of symptoms is obtained.

Craniotomy should be promptly performed upon the cases of supratentorial hemorrhage. This may consist of a decompressive operation or an osteoplastic craniotomy with the removal of the blood. In view of the fact that the hemorrhage is on the surface of the brain and not into its substance, a simple decompressive craniotomy without disturbance of the clot may at times suffice, or in very grave cases be performed preliminary to a later operation for the removal of the blood.

The delicate brain tissue of the infant illy withstands the effect of pressure. This is eloquently borne witness to by the many cases of Little's disease, the various degrees of amentia, and autopsy statistics, the compression anemia preventing normal medullation and development. The archi-

ture of the infant's skull is planned to relieve a certain degree of increased intracranial pressure, being partially distensible by means of the broad sutures and the fontanelles, which latter may be termed nature's prophylactic decompression. This provision, however, suffices for only the mildest degrees of increased pressure beyond which operative decompression must be performed to prevent the degeneration of the brain or the impending medullary paralysis in the more severe hemorrhages.

Subdeltoid Bursitis.

ISRAEL (*International Journal of Surgery*, January, 1921) in an excellent article on this subject describes the thin-walled subdeltoid bursa. Its base is formed by the tuberosity of the humerus and the tendons of the short rotators which are inserted into the tuberosity. Its roof is formed by the periosteum beneath the clavicle, the coracoacromial ligament and the acromion, and by the upper part of the fibers of origin of the deltoid muscle. Its limits beneath the deltoid muscle vary considerably, but the outline is apt to be trilobar like a clover leaf, and to extend below the edge of the acromion for about an inch and a half at its deepest point. On the whole it is circular in outline, concave-convex in shape, and about the size of the palm of the hand.

He quotes Codman to the effect that it is not too much "to assume that this bursa, like other bursæ, in response to the insult of trauma, overuse, unaccustomed use, or infection, may become inflamed, may become overdistended with fluid, may be filled with fibrinous exudate, or that its contiguous surfaces may become adherent."

The anatomy shows that the smooth action of the adjacent surfaces is necessary for abduction and rotation. Is it surprising that after a blow on the point of the shoulder the patient complains of pain on abduction and rotation, and that involuntary reflex spasm holds the joint so fixed that the scapula follows all the motions of the humerus? Is it surprising that if fixation of the arm is maintained for a num-

ber of weeks, either through misdirected treatment or the unwillingness of the patient to let those two bruised and inflamed surfaces slide on one another, adhesions between the two take place?

Suppose again that overuse is the cause of the insult to the serous surfaces. A baseball pitcher is constantly abducting his arm, carrying the tuberosity in under his acromion and then snapping it out again as he throws the ball. There is a point of friction as the highest part of the tuberosity passes under the acromion, and its continued irritation leads to a "glass arm." When adhesion takes place the arm becomes shoulder bound.

In other cases the irritation may come from sepsis, from gonorrhea, from sudden exertion or pressure, but we have a right by analogy to assume the same sequence of conditions—an inflamed serous membrane, reflex spasm, serofibrinous exudate, and finally adhesion of the surfaces. This is the ordinary life-history of inflammation of the subdeltoid bursa. When, in the severe cases, adhesion has taken place, the pain subsides and the symptom is stiffness due to actual mechanical limitation. At this point nature begins her slow cure. As in the peritoneum, the adhesions melt away, and those that have become organized stretch until at length the normal arc of motion is restored.

Clinically, we find cases of all degrees of severity, from mere discomfort in raising the arm to firm ankylosis. It is most convenient to separate three types, although border-line cases occur frequently.

First, acute or spasmodic type.

Second, subacute or adherent type.

Third, chronic or non-adherent type.

The symptoms of the first or spasmodic form are:

Localized tenderness of the point of the shoulder, just below the acromion process, and to the outer side of the bicipital groove.

In a small portion of the cases this tender point, being on the base of the bursa, will disappear beneath the acromion when the arm is abducted. When it occurs this sign is almost pathognomonic.

Let the arm be lifted away from the side as far as possible, until its elbow rests upon the doctor's shoulder. In this attitude of passive extreme abduction the bursa in question will be so slid beneath the protection of the acromion process as almost or quite to be beyond reach of pain from pressure. The exquisitely sore spot will suddenly have disappeared, whereas this position will not abolish the tenderness on palpation from any of the other causes of it in this region.

This sign, called Dawbarn's sign, is, according to his own admission, pathognomonic of bursitis only when present.

When attempts at abduction or external rotation are made, the scapula is locked by spasm after a certain point and moves with the humerus. About ten degrees of motion can always be obtained without moving the scapula. In mild cases the spasm may be momentary and occur only just as the tender point disappears beneath the acromion, or just as it reappears from beneath it in the descent of the abducted arm.

In certain mild, early cases in which there is but little spasm, the patient alleges that he cannot, unaided, raise the arm to an abducted position, but will allow passive motion. Oftentimes this is not a real inability to abduct, and the patient merely means that he cannot raise the arm without pain. This pain is probably caused by the unwillingness—if we may use such a term—of the supraspinatus to start the pull on its sensitive tendon.

Pain is felt in the region of the point of the shoulder or down the outer side of the arm, even extending into the hand. Pain at the insertion of the deltoid may be the only symptom. At night discomfort and pain are particularly annoying, and the patient cannot sleep on the side of the lesion.

Occasionally effusion in the bursa is demonstrable, and frequently puffiness is felt upon palpation.

In the subacute or adherent type adhesions exist between the roof and the floor of the bursa, and there is an absolute me-

chanical limitation to abduction and external rotation. There may or may not be active inflammation as well.

Localized tenderness may or may not be elicited, according to the degree of existing inflammation. In recent cases it is usually present; in old, quiescent cases it is absent.

Since the tuberosity cannot be made to pass under the acromion, the point of slipping tenderness is not found.

Abduction and external rotation of the humerus are limited to a greater or less extent, usually so much so that the tuberosity will not pass beneath the acromion. The ten degrees of free motion in which the function of the bursa is not called into play persist; if they do not, the true joint is involved.

Beyond an arc of about ten degrees the scapula accompanies the humerus in all its motions, whether active or passive.

The pain is often in the same distribution as in the first type, and frequently occurs in the neck also. In the severe cases it closely resembles the pain of brachial neuritis. In some instances it may prevent sleep. In other cases there may be no pain whatever.

In severe cases there is sometimes inability to extend the elbow completely.

In the chronic or non-adherent type the essential characteristic is painful motion, but the full arc of motion persists. The trouble is due to slight irregularities in the contour of the base of the bursa, usually at the external side of the bicipital groove, so that the motion, instead of being smooth and free, is interrupted in its course as the irregular point passes beneath the acromion.

Local tenderness may or may not be present; it is often absent.

If local tenderness is present, the point of slipping tenderness is also found, for this can pass beneath the acromion.

Abduction and external rotation are but little, if at all, limited, but at some point in abduction acute tenderness is experienced, which disappears as soon as the tuberosity is safely beneath the acromion. In lowering the arm this sensation is again experienced.

The scapula does not accompany the motions of the humerus; the motions may be jerky and uneven.

There may be considerable pain, especially after use.

In treating the acute cases there are two indications: the patient's comfort and the prevention of adhesions. The position of the arm is of importance. The patient may be seated beside a table and the arm laid in abduction on a pillow on the table. This position relaxes the short rotators and deltoid, and allows the tender point at the base of the bursa to avoid contact with the tip of the acromion. At night the arm is supported on a pillow placed with its long axis at right angles to the patient's body as he lies on his back. When the patient has to be about, a sling may be used with the utmost caution. He should be instructed occasionally to take his arm out of the sling and let it swing by his side or, when possible, to let it rest on the table or on the arm of his chair. A Velpeau bandage should never be used for more than a day or two. Massage, applied not to the region of the bursa but to the surrounding muscles, is of value. Counter-irritants are of little avail.

The following treatment of acute subdeltoid bursitis is given by H. F. Wolf, of New York (Mt. Sinai Hospital): "A wet dressing is kept on day and night, changed every twelve hours. High doses of aspirin, 50-60 grains daily, are given and very gentle massage is performed. The latter must be done with the palm of the hand after sprinkling a good supply of talcum powder on the parts to be treated. Relief of the pain should be immediate. If this is not the case, the treatment was too severe or the diagnosis incorrect."

What has been said in regard to the treatment of the first class of cases applies also to the more acute cases of the second or the adherent type—so long at least as the adhesions are still more or less plastic. When they have become organized and firm we have to deal with an actual mechanical impediment to motion, instead of spasm of the neighboring muscles. Frequently both

factors are met, sometimes one predominating, sometimes the other. In the severe cases treatment falls under one of the following three general plans:

A. Gradual stretching: (1) Leaving improvement to natural use. (2) Massage, passive and active exercise. (3) Manipulations by physician without anesthetic. (4) Zander exercise. (5) Baking, electric light baths, etc.

B. Rupture under an anesthetic: (1) Manipulations under an anesthetic without incision. (2) Manipulation followed by fixation in abduction.

C. Division: (1) Incision into the bursa and direct division of adhesions. (2) Excision of the subdeltoid portion of the bursa.

The first group of methods, while sometimes adequate, more often is only palliative, and at best merely shortens somewhat the duration of the disability.

Dr. Codman advocates that after breaking up the adhesions the arm should be held in abduction and external rotation by means of a modified Monk's splint. This allows the raw surfaces to be apart. He also emphasizes that "complete abduction (elevation) of the humerus necessitates external rotation. Flex your elbow to a right angle, rotate your humerus inward, and try to abduct. When your humerus arrives at the horizontal it will no longer move on the scapula, for the base of the tuberosity impinges on the acromion. Now rotate the humerus outward, and you will find that the arm will go into full abduction because the tuberosity rolls out of the way and the concavity of the surgical neck takes its place and does not impinge on the acromion."

Dr. Codman keeps a splint on from two days to two weeks. After its removal the patient puts his arm through the full arc of motion once a day or more. The Zander apparatus helps to keep the arm in good condition.

In some cases rupture of the adhesions under an anesthetic undoubtedly shortens the period of convalescence by many months. There are two main objections to it: it may tear the normal joint structures

more easily through the dense adhesions in the bursa, and thus rupture the atrophied and stiffened supraspinatus or the other short rotators, or in those cases in which the adhesions alone are ruptured there is a tendency for them to form again, since the soreness incident to manipulation starts scapulohumeral spasm once more and leaves the raw surfaces in contact.

The third form of treatment, that of open division, is recommended by Dr. Codman. All adhesions should be freed either with the finger or with scissors and forceps.

Drainage should be provided for; suturing the skin incision only.

The patient should then be placed in bed with the arm held in abduction by strapping a forearm splint to the head of the bed. Passive motion should begin early.

Dr. Charles F. Painter is of the opinion that open incision and removal of the entire sac should be practiced upon all cases, be they occupational or traumatic, which have lasted for six months or more. If they have caused trouble for as long a period as six months they will require, even after a thorough manipulation under ether, a very long time to regain normal motion, if indeed they ever recover completely.

Dr. Painter says: "Restitution of normal motion has been, accomplished with much less effort and very much sooner after the dissection of the bursa than after the most satisfactory other manipulation I have seen."

The Use and Misuse of the Curette.

FOTHERGILL (*Lancet*, Jan. 8, 1921) in a discussion on this subject observes that there is nothing to be gained by exaggerating the risks of dilatation and curetting—namely, infection, splitting the cervix, and perforating the body of the uterus. Infection can be avoided by the usual precautions. If the operator retains in his own hand one of the vulsellæ with which the uterus is drawn down during dilatation, his own muscular sense will estimate the force he is exerting upon the dilator in his other hand. Thus he should avoid the risk of

causing serious laceration of the cervix. It is much easier to perforate the uterus with a small dilator than with a large one. Therefore it is wise to push in the smaller dilators only $2\frac{1}{2}$ inches and to refrain from attempting to measure the uterine cavity until the internal os will admit the passage of a large dilator. The length of the cavity once estimated, the operator is not likely to perforate or tear the uterus with the curette. Clean perforation of a healthy uterine wall does no harm, as the uterine muscle closes the hole at once. But if the organ is so atrophied or degenerated that it tears easily it should be removed at once.

To sum up, the broad fact remains that the curette is mainly a diagnostic instrument. Apart from mere increase in the duration or quantity of the menstrual flow, and in the presence of any uterine hemorrhage whose cause is not clear, the rule, "When in doubt, curette," is a sound one.

In women of reproductive age the cause of irregular bleeding is found in the majority of cases to be retained products of conception; and it is remarkable how often these relics are found in women who will not admit that they have missed a single period. Sometimes one or more polypi are found. Occasionally, though the cervix feels normal, the curette finds a place within the cervical canal where epithelioma yields like cheese. And not so very rarely malignant disease is found within the body of the uterus. After the close of reproductive life uterine bleeding absolutely demands dilatation and exploration by curette unless the hemorrhage has an obvious cause, such as cancer of the cervix, the twisting of the pedicle of an ovarian cyst, or the degeneration of a fibroid. In these post-menopause cases exploration generally reveals the presence of cancer of the body of the uterus; but sometimes there is nothing but the result of a chronic infection whose steps are senile vulvitis, vaginitis, cervicitis, endometritis. In these cases, if the cervical canal becomes occluded after the endometrium has been infected, the result is pyometra, with distention of the uterus by pus and blood-stained purulent

vaginal discharge. Now, in cancer of the corpus uteri infection of the ulcerated new growth occurs very late, so that the discharge becomes offensive only when the disease is far advanced. The foul discharge means pyometra or late cancer of the body, while a discharge of pure blood through a clean vagina means early cancer of the body. The cases of senile hemorrhagic endometritis and of pyometra are more numerous than we realize, and they are quite curable by the curette. Thus the operator who removes every enlarged bleeding uterus in an old patient without preliminary exploration will subject to the discomforts and risks of hysterectomy a certain proportion of old ladies who could have been cured by a simpler and safer method.

Carbuncles.

PHILLIPS (*Lancet*, Jan. 8, 1921) holds that the sequence of events in carbuncle is, first, necrosis of tissue, and the inflammatory process is secondary, being the natural method of separation of the slough from the living tissues and eliminating it from the body, much as happens in gangrene in other parts. In some cases the sloughing is caused by an early thrombosis of vessels due to microbic invasion. This would be especially suggested in such cases as begin with sudden pain. The proximate cause is generally, possibly always, the staphylococcus pyogenes aureus. The author describes pain as the first symptom. He alludes to two types: the superficial and the deep. In the latter the slough is slow and eliminated with difficulty.

As to treatment the author advises local subcutaneous injections of carbolic acid 1 in 20 as a means of abortion. Hot fomentations are approved. Antiseptic applications should be avoided; squeezing is reprobated; gentle syringing of the exposed area is warmly commended. It is regarded as important to abstain from rubbing the skin with spirit or ether soap, which seems to open up the follicles in the skin and is sure to be followed by a plentiful crop of

staphylococcal pustules or secondary carbuncles.

Ointments are objectionable since they favor secondary pustules. Collosol manganese intramuscular injections are regarded as a remedy of great value not only for carbuncles, but for other staphylococcal infections. Indeed he regards it as the most efficient treatment he has used. Doubt is expressed as to the value of vaccine treatment. There is a discussion of operative treatment.

Tabes.

BUZZARD (*Lancet*, Jan. 8, 1921) places particular stress on the lightning pains of tabes as enabling the physician at times to make an early diagnosis before the other symptoms have appeared. These pains are characteristic. They stab like a knife, or a darning-needle going in, or they resemble the effect produced by taking up the flesh, pulling at it, and letting it go. The pains come not singly, but if not in battalions at any rate in platoons. They are rapidly repeated, several occurring in the course of a second or two, followed by a lull of longer or shorter duration. Bouts of paroxysms may last from a few hours to a few days and then cease for a time. The favorite sites of these pains are the heel, the inner aspect of the shin, and the inner aspect of the knee. The area within which they repeat themselves is small, described by the patient as the size of a crown-piece or no bigger than the palm of the hand. Between the frequent paroxysms these areas are often tender to light touch, so that the patient does not even like the contact of his clothes. In the early stage of the disease pains rarely occur after exercise. These pains must be recognized in all their severity to be sure of their character. Many patients confess to what they call "niggling pains," trivial in respect to suffering, but identical in nature with the lightning type.

The necessity for advising antisypilitic treatment of tabetic patients is not now so urgent as it was a few years ago, but it

may be doubted whether the principles of this treatment are yet adequately recognized. We are all asked, "How long must I go on with treatment before I am cured?" For many years Buzzard's answer has invariably been, "For the rest of your life." He said he was never consulted about a primary chancre, but if he were his advice would be the same. It cannot be denied that we are not and never have been in a position to tell a patient that he has been cured of syphilis, and as neurologists we are now constantly seeing tabetic patients who have been cured of syphilis by the arsenical compounds, just as fifteen years ago we saw those who had been cured by mercury. Buzzard maintains that the only honest advice we, as medical men, can give to patients suffering from any syphilitic disease is to the effect that they should continue to have periodic courses of treatment for the rest of their lives. Tell them that prevention is better than cure, and that they must regard this precaution as a method of insurance. In his experience so many victims of tabes and other syphilitic nervous diseases have allowed valuable time to slip by owing to negative Wassermann reactions that his confidence in this test as a method of regulating treatment was shattered.

Surgery of the Spleen.

The *Lancet* of January 22, 1921, contains an admirable contribution on this subject by SIR BERKELEY MOYNIHAN in which he reaches the following conclusions:

It is evident that a consideration of the whole subject of diseases of the spleen must take a very wide view. A number of symptoms may direct attention to the spleen, even when clinical examination does not reveal the presence of splenomegaly. It is through the correct insight into the significance of the clinical symptoms and other morbid phenomena that the real understanding of any supposed case of splenic disease becomes possible. Instead of searching only for the existence of this or that splenic disease, an inquiry should be di-

rected to the determination of the functional capacity of all the various organs likely to be deranged. The symptoms already named may be looked upon as evidence of some disorder in the particular systems now under consideration. This derangement must be regarded not merely as a restriction of the morbid changes to the spleen, but as a disturbance of wide ramification throughout the whole body, affecting one or other, or perhaps even all, of the four systems in which the spleen plays a part. The focus, at the moment, may in truth be in the pulp of the spleen; but even so the general picture presented by the patient is the outcome of the participation of the other systems in the process which started in the spleen. It may be that splenectomy in any of these diseases will remove the obvious culmination of the morbid process, and thus bring about a "cure" of the disease or an arrest of its development; but it does not by any means follow that all the other related parts are thereby caused to return to their normal states. Absence of symptoms does not imply the restitution of normal functions.

A further step in the investigation of the clinical condition of the patient should aim at the exact discovery of the site of the lesion in certain particular cell types: (a) in the spleen-pulp; (b) in the bone-marrow and in any part where reticulo-endothelial cells may exist in specially congregated or active masses; (c) in the liver; (d) in the endocrine organs, including the pancreas. This lesion being predicted or recognized, the question will arise as to whether it consists in or entails the elaboration of poisons capable of causing hemolysis, cirrhosis, or asthenia.

The tissue affected, and the changes therein resulting, being recognized, further research must be directed to the discovery of the type of infective agent at work, whether bacillary, spirochetal, or other. In other words, the patient is no longer to be regarded merely as the victim of some type of "disease," but as the victim of disorders of a certain character in certain parts of certain anatomical or functional systems of the body. The form of the disorder, the

form of distribution (determined by an assessment of the functional capacity of the several organs concerned or likely to be concerned), when correctly studied, will inevitably lead to the source and cause of the morbid state, and ultimately to the prospect of the "cure" of the patient.

"Megalocolon."

LADD (*Boston Medical and Surgical Journal*, Jan. 27, 1921) reports five cases and supplements his clinical study of these by a review of literature from which he has collected 113 cases. Sixty of the 118 were treated medically, with 41 deaths and 7 cured. Fifty-eight were treated surgically with 24 deaths; 2 unimproved; 8 improved; and 24 cured.

The two operations which are worthy of consideration are colostomy and resection of the affected colon with anastomosis between the normal gut above and the lower sigmoid below. From the figures quoted above it would appear that the chance of curing a patient by the surgical treatment was over three times as good as that by medical treatment. The chance of losing the patient is two-thirds less. The number of improved and unimproved is similar with both lines of treatment. It may be said that the disease is not a very common one and that the average surgeon does not have the opportunity to perfect his technique as much as he might wish. The largest number of operated cases reported by any one man is seven, of which five recovered and two died. It is a striking fact that practically all deaths reported from surgeons are from peritonitis, there being only one or two from shock or other causes. This being so it would seem that with improved technique and better judgment the future offers a much brighter outlook than the past, and that even now one should unhesitatingly recommend surgical treatment for all the pronounced cases. For moderate cases in which the enlargement of the colon is not great it would seem that medical treatment should be at first tried and surgery resorted to when medicine has proved unsuccessful and before the patient is *in extremis*.

Splenic Anemia: Banti's Disease.

MOYNIHAN (*British Medical Journal*, Jan. 22, 1921) quotes Banti as having described the condition to which this name is given in 1883 and again in 1894, together with the fact of Gretzel's publication in 1866. The condition he described is characterized by this author as splenic anemia. Banti considered the disease as possessing clinically three stages, merging gradually into each other. These stages were:

One in which there was enlargement of the spleen and a secondary anemia, the duration being three to twelve years.

One in which the liver gradually enlarged, and the amount of urine underwent progressive diminution; the duration was brief.

One in which the liver gradually shrank in size and ascites appeared, the symptoms being those of an ordinary atrophic cirrhosis; the duration of this stage was between one and two years.

The disease was invariably fatal, and death occurred either from hemorrhage or from autointoxication from cirrhosis.

Splenic anemia was defined by Osler as "an autointoxication of unknown nature characterized by great chronicity, primary progressive enlargement of the spleen which cannot be correlated with any known cause, anemia of a secondary type, with leucopenia, a marked tendency to hemorrhage—particularly from the stomach—and in many cases a terminal stage with cirrhosis of the liver and jaundice."

This as a rule is not difficult. The mistake Moynihan most commonly has seen was in the making of a diagnosis of gastric or duodenal ulcer. He has now seen five cases in which a patient suffering from splenic anemia was referred to him as an example of these diseases. The absence of a clear history of dyspepsia, the presence of an easily palpable spleen, and the blood changes, soon revealed the true condition.

In any doubtful case an x-ray examination would almost certainly clear the uncertainty and demonstrate the presence of a chronic gastric ulcer.

The only treatment for splenic anemia is

splenectomy. The appropriate moment for the removal of the organ is chosen. It is inadvisable to operate soon after a grave hemorrhage, or when the spleen is extremely large. In the latter case the effect of radium on the tumor should be tried; almost certainly it will cause a rapid and considerable shrinkage in the organ. If this should happily be the case, splenectomy is done when the spleen is at its smallest, and before it has begun to enlarge afresh, as it will certainly do after a few weeks. It is imperative to operate upon cases of this disease as early as possible. No other form of treatment needs consideration; the dangers and difficulties of the operation increase with the lapse of time; early operation means a more certain chance of recovery and a quicker convalescence. In the later stages the mortality of operation is higher, amounting to 25 per cent, as compared with an average of about 10 per cent. In the terminal stages operation becomes so dangerous that only the inevitably fatal outcome of the unhealed disease justifies its performance.

The degree of improvement that may take place is astonishing, even in the late stages of the disease, with advanced involvement of the liver. It is, as W. J. Mayo says, an evidence that the great power of the liver to regenerate its specific cells is utilized to the full.

The difficulties of the operation are greater in splenic anemia than in any other disease. In almost all cases adhesions binding the organ especially to the under surface of the diaphragm are present. They may be numerous and exceedingly dense, and their separation may cause a copious and grave hemorrhage. But they are never so dense nor so strong as to prevent the completion of the operation. The details of the operation in other respects are the same here as elsewhere. At the Mayo clinic up to September 20, 1920, 73 operations had been performed, with 9 deaths, equal to 12.3 per cent. The after-results are excellent; the rather high operative mortality is due to the technical difficulties of the late cases, which, apart from operation, would all be fatal.

Reviews

THE HANDBOOK OF ELECTROTHERAPY FOR STUDENTS AND PRACTITIONERS. By Burton B. Grover, M.D. Illustrated. The F. A. Davis Company, Philadelphia, 1921. Price \$4.

In his Preface the author tells us that about 25,000 physicians in the United States employ electricity as a therapeutic agent in the sense that many of them have in their possession some form of electrical apparatus. On the other hand he regrets the fact that few medical institutions include electrotherapeutics in their curriculum, and so he has endeavored in this volume to give practical instruction concerning the indications and use of the various currents in practice. While his descriptions are brief, nevertheless he has tried to make them up to date. Possibly the most important statement he emphasizes is that electricity has not magic formulas, but is an efficient helpmate in the practice of medicine.

The book contains twelve chapters, starting with elementary facts in regard to electricity; it deals with the electrotherapeutic application of galvanic and static currents, high-frequency and sinusoidal currents, the employment of electricity to improve blood-pressure and its use in genito-urinary diseases. There is a chapter upon diseases amenable to electrotherapy, another upon diathermy, still another on pain, and last of all a brief one upon roentgenology, which covers less than thirty pages. The book also contains no less than 103 illustrations. As an elementary contribution to his subject, the author has certainly come up to the task that he set himself.

MEDICAL NOTES. By Sir Thomas Horder, M.D., F.R.C.P. The Oxford University Press, New York, 1921.

In a little book of scarcely more than 100 pages Sir Thomas has gathered together notes which have already appeared in recent issues of *St. Bartholomew's Hospital Journal*. Many of them have also been

published in the London *Practitioner*. With some of his writings readers of the *GAZETTE* are familiar, because we have abstracted portions of them for our "Progress" columns. These notes were originally taken in response to an invitation to put into writing some of the remarks which Sir Thomas has let fall in the out-patient department and in the wards of St. Bartholomew's in the course of clinical teaching.

The title of the book might well have been "Medical Aphorisms," because it is made up of brief sentences or paragraphs in which the author states clinical facts in a very clear and concise manner, dealing with all the conditions which are commonly met with in practice except the infectious diseases, although he does include tuberculosis, pleurisy and pneumonia, poliomyelitis and meningitis.

Some persons have the happy faculty of saying much in a very small space, and Sir Thomas is one of these. Thus, under acute miliary tuberculosis he makes the simple statement of fact that the signs, when present, are those of wide-spread capillary bronchitis, and again under acute caseous pneumonia he writes: "A somewhat uncommon disease, the signs are those of an extensive lobar pneumonia."

GRAPHIC METHODS IN HEART DISEASE. By John Hay, M.D., F.R.C.P. With an introduction by Sir James Mackenzie, M.D., F.R.C.P. Second edition. Oxford University Press, New York, 1921.

In the eleven years which have elapsed since the first edition of this book was published enormous strides have been made in the study of heart disease by graphic methods. Even that pioneer in this subject, Sir James Mackenzie, has learned much, as has also Dr. Thomas Lewis, whose name is so closely connected with this important subject.

As the author well says, the electrocardio-

graph is now an instrument of common use and has become essential to every well-organized cardiac clinic.

The book is divided into twelve chapters, and contains, considering its size, a very great number of illustrations, namely, 176; and as there are only 173 pages in the volume it is evident that a very considerable amount of space is consumed by their introduction. Many of the tracings are original with the author, but where he did not possess typical ones to illustrate his text he has borrowed, with credit, from other writers. He includes not only the electrocardiograph, but also an adequate description of the polygraph and sphygmograph, with methods whereby records obtained with these instruments can be accurately analyzed. Those who desire a brief but adequate description of these newer methods of clinical investigation will find this book very useful.

ELECTROTHERAPEUTICS FOR THE PRACTITIONER. By Francis Howard Humphris, M.D., F.R.C.P., M.R.C.S., etc. The Oxford University Press, New York, 1921. Second edition, revised and enlarged, and illustrated. Price \$7.50.

The contents of this book are essays on certain useful forms of electrical apparatus and the use of electricity in some diseases which are amenable to electrical treatment. In this, the second edition, the author has introduced new chapters on galvanic, faradic and the sinusoidal current, and radiotherapy. His earlier contribution upon static electricity has not been much altered, or, as he expresses it, he has "rounded off one or two corners and filled in some vacant spaces." The author also expresses hope that the "scrappiness" of the first edition has been removed. The author is evidently an enthusiast on the subject of what electrotherapeutics can do, and begs of every medical man that he condemn not that which he knows not of.

It must be manifest from what has already been said that the author has not attempted to produce an exhaustive manual dealing with electrotherapy. The first sixteen chapters deal with various modes of producing and modifying electricity, and the remain-

ing fourteen with its application to diseases of various portions of the body ranging from the joints to pelvic disorders, and diseases of the skin. Although it covers just 300 pages, it is closely printed and, therefore, contains more text than the average volume of its size.

Feebleness of Growth and Dwarfism. By Dr. Murk Jansen, O.B.E. Oxford University Press, New York, 1921.

The author of this brief monograph is the Lecturer on Surgery in the University of Leyden. He tells us, when studying the nature and cause of achondroplasia, he came to the conclusion that two principles which had hitherto passed unnoticed were underlying the facts, namely, that injurious agents affecting growing group cells enfeebled their power of growth, and again that the measure in which growth is enfeebled is proportional to the rapidity of growth, which he has termed the law of the vulnerability of fast-growing cell groups. He further states that the whole of this book is an attempt to work out these principles. We must confess that we had not thought that the two facts to which he calls attention as essential had hitherto passed unnoticed, but the author brings forward grounds for the assumption that the similarity between rachitis and achondroplasia is determined by these two principles. He divides his text into two parts. In the first he deals with growth changes which are seen to develop after birth, and in the second part with congenital changes which, as he well points out, are more serious than those first named, and which one would naturally suppose would have been first considered in a book of this character. On the other hand the author points out that the congenital growth changes are often incompatible with intrauterine life, and therefore come more in contact with the pathologist than they do with the general practitioner.

In the first part he covers 44 pages and in the second 36 pages, dealing with the symptoms of feebleness of growth and its ratio to the proportion of the intensity of

the injurious agent, then proceeding to discuss the effects upon the various portions of the body.

In the second part his chapters are made up of subjects which from his Preface one would suppose would not be included. After an introduction he deals with anencephaly, achondroplasia, mongoloid idiocy, dysostosis-cleido-cranialis, congenital club-foot, and congenital dislocation of the hip.

The book is illustrated with quite a large number of figures, some of which are reproductions of *x*-ray photographs. It is in the second part of the book that we find the most numerous illustrations.

Those who are interested in the various forms of arrested development will find this contribution an interesting addition to their study.

A PHYSICAL INTERPRETATION OF SHOCK, EXHAUSTION, AND RESTORATION. By George W. Crile, M.D. Edited by Amy Rowland, B.S. Illustrated. Oxford University Press, New York, 1921. Price \$8.75.

The purpose of this volume is to present some of the researches which have been in progress for many years in Dr. Crile's laboratory and also in France during the war. Produced under pressure, the author states that adequate reference to the work of others has been impossible. The text, of course, represents to a very large extent Dr. Crile's interesting views upon the subjects which it covers. The very enthusiasm which is so characteristic of him marks its pages and at times leads him to conclusions which others, who may be less enthusiastic, will be inclined to question. But without enthusiasm little would be accomplished by any one in the way of original work, and when a busy surgeon finds time to make original contributions to medical literature he commands the respect and admiration of his professional colleagues to an extraordinary degree.

The present volume, which is published in a very handsome manner, contains 120 illustrations in its 232 pages, including the index. Some of these illustrations are microscopic sections designed to show the

changes produced in various portions of the nervous system by injury to parts which are far removed, or in some instances by emotional stress and strain, as, for example, changes which have been induced in the liver of a rabbit by repeated fright. Those who are inclined to doubt the reliability of such observations nevertheless cannot fail to be interested in these pictures.

We note with particular interest a tracing showing the effect of strychnine upon an animal in a moderate degree of shock. This tracing shows a very definite and somewhat prolonged rise of blood-pressure, which was followed by a fall to about the level it was before the injection. A second injection raised the blood-pressure again to a less degree, but a third injection produced no change. This tracing is of particular interest because we believe that many persons have thought that Dr. Crile was strongly of the opinion that strychnine was incapable of raising the blood-pressure in shock. It is quite true that this tracing may be taken as indicating that the use of strychnine, when repeated, ultimately causes exhaustion of the vasomotor center, but we believe that it is of equal value in showing that single or double doses may be useful in rallying a patient.

The pages which will probably prove most interesting to practitioners are those which deal with the effect of strychnine and adrenalin upon blood-pressure. In another tracing we note that strychnine caused an abrupt and sustained rise in blood-pressure with an increase in the length of the pulse wave, although the tracing is designed to illustrate the exhaustion of the vasomotor center by the stimulating effects of strychnine. The dose of strychnine which was given intravenously amounted to one-thirtieth of a grain, and although no statement is made as to the weight of the animal, nevertheless such a dose in proportion to its weight might easily be considered a poisonous rather than a therapeutic one for human beings.

It is not possible in the space which we have to deal with all the points which Dr. Crile brings up in a most interesting and

attractive manner. He has already won the respect of the English-speaking profession on both sides of the Atlantic for the work which he has done, and this volume will bring increased attention to a very important subject with which his name has been associated for many years.

THE SCIENCE OF OURSELVES. By Sir Bampfylde Fuller, K.C.S.I., C.I.E. Oxford University Press, New York, 1921.

We are told on the title page of this book that it is a sequel to the *Descent of Man*, from which one would imagine that it was a sequel to that celebrated volume written by Darwin many years ago. The author tells us that his thanks are due to Sir Edward Schafer, the eminent physiologist, for having read the pages and made suggestions.

Starting out with the statement that few will dispute the conclusion that the features of man's body have evolved from conditions approaching those of the ape, he tells us that his aim is to state an inferential theory which will explain the origin and course of feeling, thought, and behavior, although he admits that the undertaking must fall short of full achievement. Reasoning leads us to the conclusion that our feelings and thoughts are nervous processes owing their existence to evolutionary development of the spinal cord and brain, and while this is a view which is very hard to accept because it does violence to our respect for the human mind and runs counter to our cherished opinions, nevertheless the author believes his statement to represent a fact.

The book is divided into two parts, and in the ten chapters of part one he deals with what might be called elementary principles, while in the twelve chapters of part two he deals with the appetite, emotions, and will; fear, courage, and anger; respect, faith, and obedience; speech and writing, and numerous other cognate topics.

MEDICAL CLINICS OF NORTH AMERICA. March, 1921. W. B. Saunders Company, Philadelphia. Price per clinic year, paper \$12; cloth \$16.

Volume IV, No. 5, of the *Medical Clinics of North America* is made up of contributions by New York clinicians, who deal

with a very large number of conditions met with in general practice, varying from papers by Geyelin on *The Significance of Glycosuria* to one by Ottenburg on the *Practical Aspects of Blood Transfusion*, and another by Bass upon *Orthostatic Albuminuria*.

These clinics are printed in large type which is easily read, with heavy leading, illustrated when necessary to make the text clear, and are undoubtedly of value to medical men who are far removed from great clinical centers.

A NEW POCKET MEDICAL FORMULARY. By William Edward Fitch, M.D. Third edition, revised. The F. A. Davis Company, Philadelphia, 1921. Price \$2.50.

This closely printed book, on thin paper, of such size that it can be readily carried in the side-pocket of a sack coat, is interleaved so that the owner may from time to time place on its pages formulæ which appeal to him in addition to those which are placed in type. The book is arranged according to diseases in the order of the alphabet, and the author freely admits that his prescriptions have been taken from a very large number of works dealing with therapeutics or with the various specialties. There is a good deal of cross-referencing, so that if the physician fails to find under one heading what he is seeking the cross-reference may perchance give it to him. The last eighty pages are taken up with formulæ for hypodermic injections, with recipes for food for the sick and with diet lists which can be properly employed in various maladies. Last of all a number of double-column pages are devoted to tables of differential diagnosis.

THE PRINCIPLES OF THERAPEUTICS. By Oliver T. Osborne, M.D. W. B. Saunders Company, Philadelphia, 1921. Price \$7.

Dr. Osborne tells us in the Preface of his new book that the one point constantly in his mind has been to present the data necessary for the advanced student to well understand the object of scientific treatment, the rational use of active drugs, and the physical methods used in the treatment

of disease. He has also aimed to present undergraduate subjects, as he calls them, tersely and concisely, and has included articles on prescription writing, electricity, massage, exercise, climate, and medicinal springs. There is also a chapter on medical ethics and a list of contagious diseases which are reportable. The book contains a little less than 900 pages. Of these 900 pages, 288 are devoted to drugs; no less than 112 to endocrine glands and organotherapy; 80 to measures varying from inhalations to bladder irrigations, cupping and leeching and transfusion. Then in Part III a little less than 30 pages are devoted to vaccines and serums, between 50 and 60 are utilized in discussions of foods and diets, and 70 odd pages deal with electricity, hydrotherapy, massage, climate, and mineral springs. There are also chapters devoted to chronic drug poisoning, industrial poisoning, and the treatment of simple disturbances of the surface of the body. One of the final chapters is entitled "Practical Advice to Young Physicians."

We think our readers have already gained the impression from what we have said that the book does not attempt to be a complete text-book for the average undergraduate, but that its intention is to provide interesting and practical information for students about to graduate or for active practitioners. With this intention in mind, the author has undoubtedly succeeded in presenting a large amount of text which can be easily utilized, and has thereby provided an excellent guide for many medical men.

THE PRINCIPLES OF HYGIENE. A Practical Manual for Students, Physicians, and Health Officers. By D. H. Bergey, M.D., D.P.H. Seventh edition, thoroughly revised; illustrated. W. B. Saunders Company, Philadelphia, 1921. Price \$5.50.

For a book dealing with hygiene to have reached its seventh edition in twenty-one years with numerous reprintings is somewhat remarkable, because those who buy books dealing with this subject are not as numerous as might be, and because there are a number of other excellent text-books dealing more or less fully with this subject.

As illustrative of the universal effect produced by the great war we find that the scope of preventive measures in public health has necessitated a careful revision of those parts of the book which deal with the infectious diseases. The author goes so far as to discuss the detrimental effects of poison gases and the protective efficiency of gas masks. In the space of a little less than 550 pages the author has succeeded in condensing an enormous amount of practical information; indeed we wish that the title of the book might be a broader one, for he deals not only with the ordinary questions of hygiene, including ventilation, feeding, sewage, and the effects of exercise and clothing, but also with vital statistics and with the modes of dissemination of practically all of the infectious diseases known to man. There is also an excellent chapter upon disinfection and a valuable one upon quarantine.

NOUVEAU TRAITE DE MEDECINE. G. H. Roger, Fernand Widal, P. J. Teissier. Secrétaire de la Rédaction: M. Garnier. Masson et Cie, Editeurs, Paris, 1920. Price 35 f., net.

Volume I: Infectious Diseases.—The first volume of the new French System of Medicine begins with a chapter on infections by Roger, which is of a general philosophic character and deals with the subject in an informing manner. It is interesting to note that Roger assumes rather more definitely than do others the parasitic character of the inclusions observed in smallpox and vaccinia, and classes them among the spirochetes. Bacterial toxins he divides into endotoxins, exotoxins, and peritoxins; the last constitute the protective covering of bacteria and are essentially lipid in nature. Roger also writes the chapter on the general streptococcic infections and on erysipelas. He recommends antistreptococcic serum in erysipelas, especially in erysipelas of the new-born. In the chapter on Septicemia by E. Sacquépée, among the many causes given the reviewer failed to find dental abscesses and pyorrhea. The chapter on Pneumococcic Infection and Pneumonia, by Menetrier and Stévenin, is exhaustive and deals more thoroughly with the pathological

physiology and the pathology than is the case in American text-books. The section on Serum-therapy is, however, too brief. Infection with the staphylococcus, with tetragenese, the enterococcus, Pfeiffer's bacillus, the diplobacillus of Friedländer, psittacus and proteus are interestingly treated by Magaigne. The latter does not consider Pfeiffer's bacillus as the cause of influenza, but as a secondary invader. An interesting chapter on putrid infections, in which putrid and gangrenous diseases of complex origin are discussed, is contributed by A. Veillon. The chapter on the meningococcus and on meningitis by Dopter is good, but fails to mention the important work done in this country by Herrick and others. The final chapter on gonococcic infections by M. Hudelow is exhaustive, occupying no less than 86 pages.

Throughout the work the bacterial cause rather than the local disease is emphasized, the various chapters being devoted principally to pneumococcie, streptococcie, gonococcie, etc., words for which the English language has no good equivalents. They can of course be rendered as pneumococcia, streptococcia, gonococcia; and as serviceable expressions for all forms of infection by the corresponding organisms, these terms might well find a place in medical nomenclature.

As a whole the *Traité* is unusually satisfactory and very nearly attains the ideal set for it by the editors, namely, that it should exemplify "*les qualités primordiales de l'esprit français, l'exactitude de la documentation, la finesse de la critique, la clarté de l'exposition.*"

D. R.

THE EXTRA PHARMACOPŒIA. By Martindale and Westcott. Seventeenth edition, Volume II. H. K. Lewis & Company, London, 1921. Price 17s. 6d.

Some months ago we noticed in terms of highest praise the appearance of Volume I of the seventeenth edition of this valuable publication. The second volume forms an addendum to the first and contains an immense amount of information dealing with the chemistry of various substances which

are used by the pharmaceutical and medicinal profession. For this reason this volume will not appeal to practitioners to the extent of Volume I, but on the other hand chemists and druggists will find it a book which will prove of very material aid. Printed on very thin paper, nearly 700 pages take up so little space that the book can be readily carried in the coat pocket, and its utilization is materially improved by the use of a flexible binding. If there is any book upon the surface of the earth which contains more information of value and interest as this one in such concentrated form we would be glad to know of it.

ORTHOPEDIC SURGERY OF INJURY. By Various Authors. Edited by Sir Robert Jones, K.B.E., C.B., F.R.C.S. Volumes I and II. Henry Frowde and Hodder & Stoughton, London, 1921.

Perhaps the major regret in the mind of one who has followed all of Jones's writing and work with entire approval and profit is to the effect that these volumes have in their entirety not been written by Jones himself. He has, however, chosen associates whose names and whose work are well known to American surgeons and practitioners, among them Sir Thomas H. Goodwin, Arthur Keith, Sir Henry M. W. Gray, Joel E. Goldthwait, E. W. Hey Groves, E. Farquhar Buzzard, Bristow, T. P. McMurray.

The editor fortunately has contributed largely. In his Preface he states that orthopedic surgery is based on, and consists of, the recognition and practice of definite principles of treatment, whether operative, manipulative, or educational, which lead to the restoration of function in nerves and muscles and in deformed or disabled limbs. The orthopedic mind is trained to think in terms of function. The operative stage, for which the surgeon should be fully equipped, although essential, has only its proportional value. It is noted that a governing principle in regard to curative work is founded on the knowledge that voluntary movements are of much more value than passive movements. Voluntary movement in one of its various forms has a direct curative effect upon the

muscular structure. It is further noted that at the orthopedic centers at one period during the war there were 500 compound fractures of the femur, with an average shortening of half an inch, and in none of those cases was internal splinting resorted to. Especial emphasis is laid upon the need of a thorough knowledge of general surgery by any surgeon who practices a special branch.

Jones expresses a deep debt of gratitude to the American government for the loan of twenty-five trained orthopedic surgeons during the war. He also notes with due appreciation the contribution of an article on the curative workshop by his Majesty, King Manuel, who created it, and for two years devoted the better part of each day to organizing and superintending the work. It is characteristic of Jones that his first volume should open with a paper on "The Principles and Practice of H. O. Thomas," who died in 1891, and whose studies and publications have had such a potent influence upon the proper development of orthopedic surgery. Then follows "The Prevention of Deformities," by Sir Henry M. W. Gray; "The Principles of Orthopedic Surgery as They Apply to the Military Need," by Joel Goldthwait; "Simple Fractures of the Upper and Lower Limbs," by W. H. Trethowan, somewhat briefly discussed. Jones discusses "Mal-union of the Femur" in less than four pages, but with his customary vivid illuminating touch.

We find discussed through these volumes Chronic Osteomyelitis; Disabilities of Joints of the Upper Extremities, both in general and particular; the Orthopædic Surgery of the Hand and Wrist; Amputations and the Organization and Equipment of Centers for the Limbless.

In the second volume the question of the Surgery of the Peripheral Nerves is taken up in much detail. Tendon Transplantation, Injuries of the Head and Spine, and Purely Functional Reflex Disabilities in Their Relation to Orthopædic Surgery; Splints and Plaster; the Use of Electricity; Massage; the Ling System of Exercises; Hydrotherapy; Orthopædic X-ray Work; Scheme and

Organization of Curative Work Shops, by King Manuel; the Organization and Administration of a Military Hospital.

In these volumes are found subjects not usually included under orthopedic surgery.

Probably the whole profession would welcome more Jones and fewer "various authors." As is true in all books thus compiled the various authors vary greatly in the completeness and efficiency with which they have traversed their subject. The compilation, however, has in it Jones's work, nor can the surgeon nor the orthopedist do without it.

TRAUMATIC SURGERY. By John J. Moorhead, B.S., M.D., F.A.C.S. Second edition. W. B. Saunders Company, Philadelphia and London, 1921.

This, the second edition of Moorhead's excellent work, embodies the results of the experience acquired during the war. The purpose of the book is to place in one volume the information necessary to diagnose all of the usual and most of the unusual effects of accident and injury. The arrangement does not differ from that recognized as somewhat standard.

In regard to shock, there is not the discussion concerning the underlying cause which has so largely occupied space in current literature, nor do we find mentioned the theory of absorption from crushed tissues, which has much to support it and has a distinct bearing on practice.

In the section upon Injuries of the Joints there are excellent pictures of blood supply, credit being given for these to the surgical clinic of Dr. John B. Murphy. There is an adherence to through-and-through drainage tubes which recent practice has seemed to indicate undesirable.

The classification of subjects is in accordance with the usual practice. Under Fractures the reader finds approved the methods which large recent experience has shown most serviceable. Injuries are taken up from the regional standpoint.

Injuries to the Head, the Spine, the Chest and the Abdomen are considered under indicative headings. Injuries to the nerves,

blood-vessels and lymph vessels are taken up together. Burns, heat-strokes and frost-bites receive brief consideration.

The author is evidently not impressed with paraffin treatment of burns, or any modification of it. In the treatment of drowning, mechanical apparatus is characterized as unreliable, the advice being given to place reliance on manual means. It is stated that a tube introduced into the trachea attached to a bellows may prove a valuable emergency method.

As to treatment for suffocation by smoke inhalation, the inhalation of fumes from vinegar is regarded as a valuable adjunct,

and it is maintained that a favorite remedy with firemen is birch beer.

Next is considered Injury in Relation to Abortions, Appendicitis, Visceral Prolapse. There is a chapter devoted to Traumatic Neuroses, and an excellent one; a chapter to Eye and Ear Tests and Standards, to X-rays and X-ray Burns; one to Medico-Legal Phases, of distinct value to all practitioners of either medicine or surgery. Finally, a chapter on Standardized First-aid Methods in Accident, under which caption is also found a description of a standardized first-aid room and of a standardized method of physical examination.

Correspondence

Cure of Hernia by Vaccine.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: It is generally observed that cuts or gaps in the skin heal up as a result of inflammation even when they are not sutured. This gave me the idea that inflammation may be the chief cause of the cure of hernia by operation, and in order to investigate this I inoculated 100 millions of bacillus pyocyaneus vaccine into the abdominal ring through the inguinal canal after reducing hernia in a case of inguinal hernia three years ago, and found to my satisfaction that the hernia was cured. The man remained cured of hernia for nearly two years, till his death from influenza. During the last three months I tried this method in five more cases of inguinal hernia (scrotal). Out of these six cases four recovered completely, and in two the recovery was partial—that is to say, there was no protrusion, but only an impulse on coughing. The cases are under observation to see whether these results will be permanent.

The injection of vaccine produces a slight rise of temperature, varying from 100° to 102° the same evening. The next morning the temperature comes to normal and remains normal throughout the treatment. With this temporary rise of temperature the patient feels some tenderness over the seat of injection for a day or two, and nothing more. The treatment is so simple and the result so effective that it is worth while to recommend its use in every case of hernia.

A purgative is administered a day before treatment, and a complete rest is enforced for ten days. Use of bedpan and glycerin-enema are quite essential during this period. Afterwards the use of spica bandage for a month is required to complete the cure.

S. MALLANNAH, M.D., D.P.H.,

Bacteriologist to

H. E. H. the Nizam's Government.

HYDERABAD, DECCAN, January 6, 1921.

[The above communication is of interest, but we would advise caution in resorting to it.—EDITORS.]

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Original Articles

Saphenoperitoneal Anastomosis for Ascites, Due to Cirrhosis of Liver

BY J. P. GRIFFITH, M.D., F.A.C.S.

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When Ruotte in 1907 suggested that ascitic fluid due to cirrhosis of the liver be drained off into the general circulation by means of a union between the saphenous vein and the peritoneal cavity, he provided a method of exit not only physiologically sound and mechanically correct, but one quite feasible as well.

It may be theoretically more advisable to prevent the occurrence of an ascites by providing a collateral circulation which will relieve the congested capillary portal apparatus, as carried out in the Talma operation,

from the following case, in which we had an extreme grade of atrophic cirrhosis without symptoms due to the perfect compensatory circulation carried out by the following group of veins:

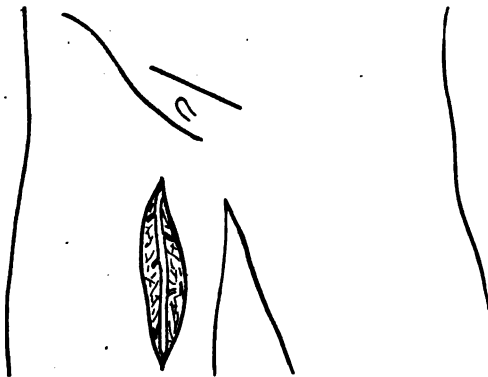


FIG. 1.

but the building of such pathways is never certain of accomplishment even under the best of circumstances. One of the strongest factors in favor of a trial by saphenoperitoneal anastomosis is found in the deduction

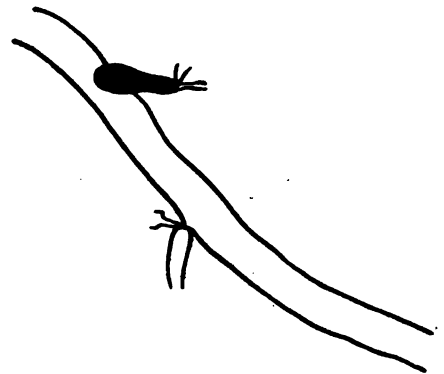


FIG. 2.

1. Accessory portal system of Sappey, of which important branches pass in the round and suspensory ligaments and unite with the epigastric and mammary systems.

2. By the anastomosis between the esophageal and gastric veins.

3. The communication between the hemorrhoidal and the inferior mesenteric veins.

4. The veins of Retzius, which unite the radicles of the portal branches in the intestines and mesentery with the inferior vena cava and its branches.

Just so long as this compensatory circulation is adequate we will not have ascites in cirrhosis of the liver. The remarkable efficiency of this work of nature is seen in those rare cases of complete obliteration of the portal vein without the presence of



FIG. 3.

ascites. When the compensatory circulation fails I feel convinced from results obtained that these unfortunate individuals should have the chance of relief afforded by a saphenoperitoneal anastomosis, which operation at least approaches nature in her effort to take care of the crippled capillary system of the liver, and can be accomplished with very little risk to the patient.

In cirrhosis of the liver we know that the one characteristic pathological finding is intrahepatic fibrosis. Any procedure that is attempted for the relief of this embarrassment is purely palliative. The average

FIG. 4.

duration of life in these cases in which we resort to frequent paracentesis, except the rare instances in which we find that the ascites is held in abeyance by a more thorough compensatory circulation, is about ten weeks. The body cannot withstand for long the tremendous loss of fluids. If we can keep this fluid actively circulating in the proper channels we may keep the individual

comfortable and useful for years, as I have observed in the first case I operated upon, January 15, 1916. This man is working every day in the steel works; present age sixty-one.

The ideal or selected case for this operation would be the one with an alcoholic cirrhosis and a minimum amount of cardiorenal involvement. The cases that have done well in my series of eight have all belonged to this class.

A brief report of the cases published in this country is as follows:

Dr. H. Edward Castle, of San Francisco, two cases (*Journal A. M. A.*, Dec. 30, 1911).

Dr. R. T. Miller, of Pittsburgh, Pa., six cases (*Penn. State Med. Journal*, March, 1916).



FIG. 5.

Dr. Bertram M. Berpheim, one case (*American Journal of the Medical Sciences*, June, 1916). He also records twenty-five cases, all performed in Europe.

Personal communication with Dr. Paul Sieber reveals that he has operated upon some twenty cases, which is the largest number at hand from any one source.

The improvement in the cases reported is about 50 per cent. Why a more general use has not been made of the procedure, or what results a wider trial would bring forth, cannot be surmised. The operation can be done with impunity, lends itself readily to local anesthesia, and causes little or no shock.

Report of cases, eight in all, not selected:

Three cases well after five, three and two

years. By this I mean free of ascitic fluid and able to do their daily work.

Of the five cases that died from two to six weeks after the operation, three had an associated factor in syphilis as the causative influence in the cirrhosis.

One case was seventy years of age and had a marked arteriosclerosis. The last of the five cases was operated two months ago. He did well until he developed a suppurative parotitis; from this time until his death the abdomen presented marked evidence of rapidly accumulating fluid. An autopsy in this case, a man of forty-six years, revealed a typical hobnail liver. Dissection of the anastomotic area by Dr.

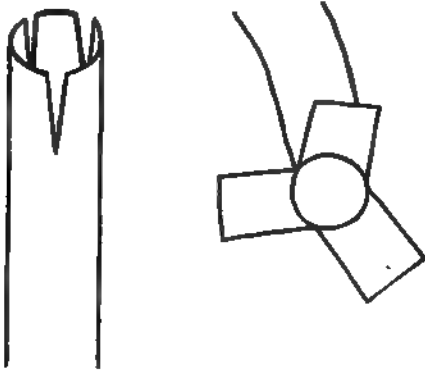


FIG. 6.

Ritchie showed a thrombotic condition of the saphenous and femoral vein in the neighborhood of the anastomosis.

OPERATIVE TECHNIQUE.

Incision over the course of the saphenous vein, starting one inch above saphenous opening and going down the thigh for a distance of eight or nine inches; the vein is dissected free an equal distance (Fig. 1). There is quite an advantage to have the vein sufficiently long, which prevents kinking when it is turned up to become attached to the peritoneum. The collateral branches are ligated close to the lumen of the vein to prevent a possible thrombosis (Fig. 2).

A second incision is made above the external ring (Fig. 3) in the direction of the fibers of the external oblique muscle. With the exposure of the peritoneum the intra-

peritoneal pressure, due to the ascitic fluid, will produce a bulging of the peritoneum and provide an accessible area for the anastomosis.

The liberated saphenous vein is brought up through the subcutaneous tissue to the

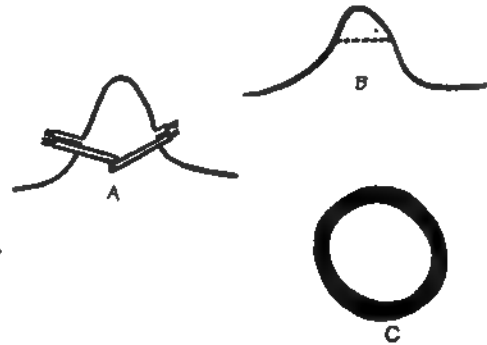


FIG. 7.

site of the anastomosis to the peritoneum, by making a pathway with a blunt instrument, preferably a uterine sound, curving outward to avoid kinking at the saphenous opening (Figs. 4 and 5).

The vein is cut flush and its lumen washed with normal saline solution to free it of any clots. Three incisions, equal distances apart, are made along the long axis of the vein from the cut end for a distance of 1 cm., which leaves three flaps that are utilized for the end-to-side anastomosis with the peritoneum (Fig. 6).

FIG. 8.

The peritoneum is clamped to prevent leakage (Fig. 7 A). The apex of cone-shaped projection is cut flush (Fig. 7 B), which presents a circular opening (Fig. 7 C) ready for the apposition of the vein flaps. The three flaps of the vein are sutured to the circular opening of the

peritoneum, using fine silk. The three intervening spaces are likewise brought in apposition (Fig. 8). These sutures are placed close, care being taken not to encroach upon the lumen of the vessel. The

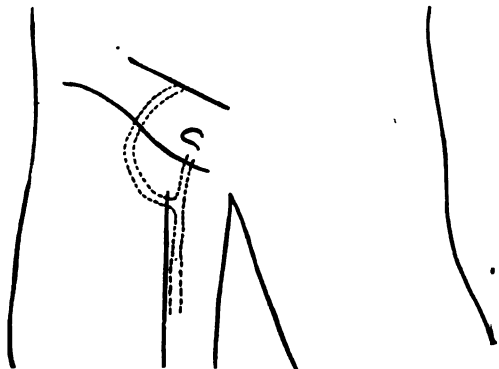


FIG. 9.

clamps are removed, and if there be any leakage, extra sutures are placed accordingly. If we have completed our anastomosis accurately, the flow of fluid from the peritoneal cavity into the vein can be plainly observed

The incision in the abdominal wall is

closed rather loosely so as not to have any pressure on the anastomotic area.

The completed operation may be represented by Fig. 9.

POSTOPERATIVE NOTES.

In the cases that do well the urine output increases anywhere from 30 ounces daily before operation to as high as 150 ounces for twenty-four hours following anastomosis. The kidneys being efficient can readily take care of this increase. The urinary output in the cases that did not respond was not so pronounced; this no doubt was due either to a crippled condition of the kidneys or a poor anastomosis, or both.

The majority of the cases which failed required weekly tapplings following the operation. There have been some few cases of failure which came to autopsy, and the frequent condition found was a plugging of the anastomotic opening by fibrin, in addition to the case I mentioned that revealed a thrombosis.

The Frequency of Pyelitis in its Relation to the Nosology of So-called Obscure Temperatures in Infants

BY HARRY LOWENBURG, A.M., M.D.

Pediatricist to the Mt. Sinai and to the Jewish Hospitals, Philadelphia

Effect must follow cause. It is not difficult to observe the former. It is frequently not easy to determine the dependence of the latter upon the former. Conclusions may not, in this respect, be hastily drawn. To adopt the creed of "*post hoc, propter hoc*" is often most misleading. Griffith years ago, in a short but nevertheless illuminating contribution, demonstrated most convincingly that it is frequently "*post hoc, ergo non propter hoc*." Nowhere is the difficulty experienced to a greater degree than where the physician must determine the nosology of temperature of more or less

indefinite duration occurring in young children and infants in whom no other evidences of disease present themselves. One's ability to discover the cause of temperature of so-called obscure origin is determined solely by the ability and the desire to conduct a thorough and painstaking physical examination, and by the limitations of laboratory investigations and the use made of these. One unknown or unsuspected factor after another has been revealed as possessing important etiologic influence. Thus do we now recognize previously undetected empyema of the

interlobar type, or of the free variety, deep-seated adenitis, posterior pharyngeal abscess without obstructive symptoms, etc.

It has not been so many years ago since otitis media acuta was disregarded as a factor in the production of fever in infants. Until spontaneous rupture occurred the obscure cause, so called, was not revealed. Now neither pediatricist nor general physician of standing would consider complete any examination without it included aural illumination and inspection of the drum membrane; indeed, no examination so lacking in thoroughness as to exclude this investigation would be complete, and the physician may consider himself no master of the situation until he has acquired the necessary skill to conduct an ear examination and routinely applies it with the same monotony as he takes the temperature. To-day acute otitis media is a commonly made diagnosis, and the aurist is summoned by the internist, be he specialist or general practitioner, to incise a bulging and inflamed drum before the infant, by pulling or evident pain, directs attention to the affected organ. Even the laity has been educated sufficiently to expect an examination of the ear. Thus too is "teething" being gradually deposed from the position of dignity which it formerly occupied as a cause for fever, and so similar instances where obscurity of diagnosis prevailed are being clarified.

It is to emphasize the importance of a disease, common enough in infancy, but frequently overlooked by the general practitioner in particular, that this presentation is made. I refer to acute pyelitis of infancy. It is overlooked because the simple yet withal important procedure of examining the urine of infants is "more overdone in the breach than in the observance."¹ The cause for this may probably be found in the fact that the method of collecting the urine is somewhat more difficult than in adults. The busy physician will not trouble himself to depart from his routine. He requests from the adult a specimen of urine, and it is handed to him. From the infant

he must take measures to collect it. This is time-consuming, and he will not devote his busy minutes to it. Hence as time goes on the importance of the procedure is lost upon him. Teachers of pediatrics have not given to pyelitis the importance which it merits in the nosology of morbid infancy. So frequently, however, are cases encountered that it cannot be long ere this disease will stand on a parity with acute otitis media as to its influence in being responsible for temperature in the young, especially females. Then he will be an embarrassed exponent indeed of the art of pediatric diagnosis who fails to take account of pyelitis in the study of a particular case or cases of so-called obscure temperature.

The first important contribution on pyelitis was made by Holt² in the *Archives of Pediatrics* in 1894. Thompson added valuable contributions in the *Scottish Medical and Surgical Journal* for July, 1902,³ and again in April, 1910, in the *Quarterly Journal of Medicine*.⁴ Constitutional or other symptoms, aside from irregular fever of more or less indefinite duration, may be absent. An examination of the urine reveals pus, and the riddle is solved. The number of leucocytes or pus corpuscles to the field necessary to a diagnosis may cause some confusion. Thus an infant with vaginitis may show many such in the urine and not be a sufferer from pyelitis. In the absence of this, however, eight or ten or more corpuscles should at least create a strong suspicion. Still⁵ places the number as low as six or less to the field. This alone, without fever or albumin, would to my mind hardly, in a female infant, be convincing evidence. Neither a few corpuscles alone nor albumin alone, occurring in traces, would make certain the diagnosis, but both together presenting in an acid urine, obtained by catheter or after vulvar cleansing, especially if the colon bacillus is present, offer convincing evidence, in the presence of fever, not due to other demonstrable cause, of the incidence of this disease. Cases of pyelitis occur without fever. In these, however, the history of a

previously acute illness, not far removed from the present, and probably not diagnosed, is usually available and highly suggestive. In other words, the case has become subacute or chronic. The general health remains good, but the urine contains pus. Relapses or acute exacerbations are quite common under these circumstances. It is sometimes difficult to determine whether the urinary findings are dependent on the local condition or whether they are secondary to some remote infection and result merely as an evidence of toxic irritation of the kidney cortex. Pneumonia, meningitis, diarrhea, influenza—in short any acute infectious disease—furnish striking examples of this. If no other disease, however, be present, or at least demonstrable, and typical urinary findings occur, the diagnosis of pyelitis at once becomes inevitable.

On the other hand other constitutional features may be intense but not necessarily of such character which would forcibly direct attention toward the kidney. In fact, in some severe types, there may be striking constitutional manifestations which for the time at least, or until urinary findings were revealed, would direct attention away from the kidneys. Convulsions and rigors (Thompson) may strongly suggest meningitis or pneumonia. They are not uncommonly encountered, especially the latter. There is of course an absence of distinctive physical signs (results of lumbar puncture and consolidation), and the urinary findings will reveal pus and albumin in an acid urine.

Most cases begin abruptly with high fever in an otherwise up to now healthy female infant, and the majority are confined to this sex. In Still's⁶ 28 cases under one year, 3 occurred in boys. Of 14 older children all were girls. Holt⁷ also states the more common frequency amongst girls. The figures offered by Thompson and quoted by Griffith⁸ indicate the rather frequent occurrence of acute pyelitis in male infants and children under two years. My own experience is more in keeping with the general

authoritative opinion that girls are the more frequently affected. I have met two cases in boys. The infant may shake and be blue (convulsions and cyanosis) in the beginning. Vomiting is sometimes intense and persistent, as are also acute enteric symptoms. So frequently is diarrhea encountered that some authors regard the pyelitis as secondary to the alimentary disturbance—in fact say that infection occurs by reason of the soiling of the vulva by fecal discharges. The latter may be true, but to my mind the soiling occurs during health from indifferent and improper cleansing of the parts following normal bowel discharge. The former, however, I regard far from certain and believe that, in the majority of instances, the gastrointestinal phenomena result as secondary features incident to the pyelitis which is the primary infection, just as any acute alimentary upset, marked by vomiting and diarrhea, may and frequently does follow any other parenteral infection, wherein, by reason of the said infection, the food tolerance is diminished far in excess of the food intake.

The burden, light enough in health, now becomes too heavy, and disturbed alimentary function readily and rapidly ensues. From my contact with fellow practitioners I am led to believe that this view is correct and cannot be too strongly stressed, as the majority of cases of pyelitis which I see have been disregarded because of the acute alimentary disturbances for which they have been solely treated. The measures instituted are dietetical and medicinal, directed entirely toward the intestinal tract. Of the latter bismuth, castor oil, and calomel have not been the least frequently employed. No influence is made upon the temperature and upon the constitutional and alimentary features until the pyelitis is recognized and properly treated, and in the majority of instances cured.

Aside from the classical urinary findings already referred to there are few if any local symptoms that would direct attention to the kidneys. Abdominal tenderness along the ureters has been mentioned

by Still* in a case wherein one kidney was thought to be affected after the first had healed. At first there was pain on the right side, and later, after the urine had cleared under treatment, pain on the left side accompanied a secondary rise in temperature and the reappearance of pus and albumin in the urine some time after treatment had been suspended. As no cystoscopic examination was made, of course the conclusion was hypothetical, although the pain and pus disappeared when treatment was again instituted. Painful and frequent micturition are seldom present unless cystitis accompanies the condition, and this rarely happens. Cystoscopy and ureteral catheterization offer a valuable means of studying and of treating chronic pyelitis which yields neither to potassium citrate, hexamethylamine nor vaccines. The work of Kretschmer and Helmholtz, published in a recent issue of the *Journal of the American Medical Association*, in this connection is extremely important and should lead to further use of this method of investigation and of treatment in the light of their splendid results.

Aside from containing traces of pus and albumin the urine is sharply acid and contains commonly (perhaps in 90 to 95 per cent of the cases, *i. e.*, of acute pyelitis) the colon bacillus, which thus becomes the primal bacteriologically etiologic factor. In all of my primary cases this organism was present. This experience was in accord with authoritative conclusion. The bacillus exists in pure culture in, as stated, a sharply acid urine. This fact is important in determining treatment. Other organisms occur, but in all such instances the infection is usually secondary to other visible pathologic processes, as perinephritic abscess, rupture of psoas abscess into the kidney pelvis, renal calculus, etc., etc. All these diseases are rare in childhood. Thus have been recovered streptococci, staphylococci, diphtheria bacilli, pneumococci, tubercle bacilli, etc. In nearly all these instances the urine may be alkaline.

The diagnosis depends almost exclusively on the results of a urinary examination, and it may not be out of place to again emphasize that the purpose of this paper is simply to again bring this disease forcibly to the attention of the physician who handles babies and to urge him to routinely examine the urine of every infant and child who has fever. If he does he will never fail in the recognition of this disease. If he does not, he is helpless to detect it. It seems strange that this simple maneuver must be urged upon otherwise fully competent doctors, but to deny it would not help matters. The urine should not be centrifuged for microscopic examination, otherwise the apparent number of corpuscles will be exaggerated and results will be misleading. But a drop or two of urine are sufficient to determine the presence or absence of pus. If no other way is available to secure a specimen, a soft-rubber No. 8 to 10 French catheter is very readily passed through the urethra of a female, and with very little additional trouble, of the male. While I have seen no ill effects follow catheterization, it is really not necessary if time is not pressing. If, however, it is desired to obtain a specimen for bacteriological study or for vaccine purposes, a sterile catheter is needed, and the urine should be received into a sterile test tube. Where catheterization is not practiced the urine may not be collected on a sponge or piece of absorbent cotton, for in this manner the corpuscles may be lost. It is best secured by placing the infant on a crumpled up piece of rubber or oil cloth and pouring the urine thus collected into a receptacle, or the infant may be conveniently placed upon a pus basin.

Clinically acute pyelitis must be distinguished from acute gastrointestinal disease, meningitis, appendicitis, pneumonia, otitis media, typhoid fever, dentition, cystitis, or in fact from any disease in which high temperature obtains. Again, this may be only accomplished by a carefully conducted routine examination of the urine.

TREATMENT.

Potassium citrate, or other alkalinizing agent, must be administered in dose sufficient to produce complete alkalinity of the urine. This reaction must be maintained over a period of time sufficient to permit the urine to become pus and colon bacillus free. The effect of the citrate is practically specific. The temperature commences to fall almost immediately, and will not rise again unless the drug is withdrawn too early. Thus we may really play with the temperature, causing it to rise and fall at will by withdrawing and readministering the drug. Still¹⁰ remarks that "there is hardly anything more striking in the field of therapeutics than the effect of proper treatment upon acute pyelitis in infancy." Holt¹¹ adds that a large amount of alkali is necessary to alkalinize the urine and that "citrate of potash sufficient to render the urine alkaline is apt to cause diarrhea or vomiting." This has not been my experience. I have employed this agent in a seven-months-old infant, first seen in consultation in Charlottesville, Virginia, and later treated at the Jewish Hospital, Philadelphia, in doses of 20 grains every two hours night and day for a period of weeks, not only without ill effect but with what appeared to be a life-saving result. This infant was, in a semicomatose state, it having been previously ill for a period of one month with what appeared to be an unexplainable temperature. Examination of the urine, up to this time neglected, laid bare the cause and indicated the cure. Each time citrate was withdrawn the infant relapsed, as the urine became acid and the organisms (colon bacilli) and pus corpuscles again appeared. Citrate in gradually diminishing amounts was continued for one year. The infant at this time is in perfect condition, according to a letter recently received from the mother from Kentucky. She states that during the year there were times when pus and temperature again appeared, but they were made to speedily disappear by the use of citrate. I have

on two or three occasions noted mild ill effects from alkalies. Edema of the eyelids has been the most common. Both upper and lower lids (important in distinguishing edema of lids due to nephritis, where usually only the *lower* lids are affected) were involved. This edema is probably due to alkalinoses, and disappears following a temporary suspension of the drug or a reduction in the dose. Instead of citrate of potassium the soda salt may be employed, or sodium bicarbonate. Fatal and nearly fatal instances, the latter with spasmophilia or tetany (used synonymously), have been met from excessive ingestion of sodium bicarbonate. The former occurred in my own practice in an infant, not the subject of pyelitis, but of asthma and eczema. It was proposed to treat these by alkalization, and bicarbonate of soda, in the amount of 3ij, was scattered throughout the food daily. The infant developed universal edema, subnormal temperature, convulsions and coma, in which it died. In another instance of eczema, universal edema and drowsiness intervened, but they subsided upon withdrawal of the drug. Yet in other cases, in which sodium citrate was employed in the milk formula as an anti-emetic after the method of Poynton and Wright, the incidence of edema, at first mistaken for normal gain in weight, has been observed. Morse, on October 29, 1920, verbally reported before the joint meeting of the New England, the New York and the Philadelphia Pediatric Societies in Boston, the case of a child some three or four years of age, who had received about 750 grains of bicarbonate of soda within a brief space of time for pyelitis, and who had developed drowsiness, edema, twitchings, carpo-pedal spasms, and the electrical and reflex phenomena of spasmophilia. All symptoms subsided upon withdrawal of the drug and were made to reappear upon renewed administration of it, and even when potassium citrate was substituted and given for effect upon the urine.

These experiences are emphasized not to discourage the use of alkalies in this dis-

ease or in any other, but merely that they may be recognized when they appear so that these drugs may be administered with caution and that the enthusiasm for alkalization may not carry the physician too far afield. As against this I have as previously stated administered potassium citrate in 20-grain doses day and night every two hours over a period of weeks, and thence continuously for a period of a year, in reduced amounts, in a case of pyelitis, without the least noticeable ill effect. I have no experience with bicarbonate of soda in pyelitis.

Hexamethylamine has given me no encouraging result except where it apparently produced temporary cleansing of the urine in a chronic case without fever. Alkalies may not be administered during the use of hexamethylamine. There are cases which will yield neither to this drug nor to the alkalies permanently—i.e., there is always a relapse when the alkali is discontinued, and it cannot be administered forever. In these instances the organisms probably remain dormant during alkalization of the urine. Later they may resist the alkaline environment in which they find themselves by a change in their nature or strain and become clinically active. They are alkali-fast. In these instances it is impossible to clear the urine, although the infant, being free of fever, remains clinically well. The vaccines may be tried, but they must be autogenous and given fresh in large doses over quite a period of time. In a boy I witnessed what appeared to be a striking effect. In other cases vaccines seemed to be helpful, and in yet others their effect was doubtful.

Case 1.—Baby K., female, 7 months. Seen in Charlottesville, Va. Treated four weeks for "fever." General examination had revealed nothing. Blood showed 16,500 leucocytes. Examination of urine indicated pus in large amount and albumin in traces. Urine acid. Colon bacilli recovered. Treatment: Potassium citrate, gr. xx every two hours day and night with one or two injections of autogenous vaccine. Result,

recovery with intermittent relapses as drug was withdrawn. Recovery in each instance after readministration of alkali. Final result, complete recovery.

Case 2.—Baby F., female, aged 6 years. Cloudy, acid urine, containing pus in large amount, albumin, and colon bacilli. History of previous acute illness marked by "fever." No diagnosis had been made at this time. Treatment: potassium citrate gr. xx every three hours. Urine seemed to clear somewhat, but was not entirely clear. Alkalies withdrawn and hexamethylamine gr. iij every four hours administered. Urine became clear. Relapse. Potassium citrate resumed with autogenous vaccine; no effect. Hexamethylamine tried again with vaccine; no effect. Ureteral catheterization proposed. Parents refused, and impossible to find a genito-urinary surgeon who would attempt the maneuver. Case clinically well except for pus in urine. Advised to abandon treatment temporarily.

Case 3.—Female, taken suddenly ill with high fever, rigor, and gastric symptoms. Case diagnosed as pyelitis by Dr. W. C. Batroff, with whom it was seen in consultation. Urine acid, cloudy, and contained pus, albumin, and colon bacilli. Hexamethylamine with sodium benzoate had done no good. Potassium citrate advised, gr. xx every three hours. Result, recovery to date.

Case 4.—Female, aged 6 months. Acutely ill for four weeks with fever and gastrointestinal symptoms. General examination negative. Pus, albumin and color bacilli found in acid urine. Potassium citrate, gr. xx every three hours and autogenous vaccine. Complete cessation of all symptoms, and pus, albumin and bacteria free alkaline urine within three days. Has remained so for one month, alkali being continuously administered, though less often throughout this period.

Case 5.—Female infant, seen with Dr. J. Vomiting. Loose dyspeptic stools, high fever, drowsy. Ill two weeks, general condition poor. Diagnosis, gastroenteritis. Treated by starvation, hunger period,

purgation, various food adjustments, colonic irrigations, bismuth, chalk, and astringents. Urinary examination revealed large amount of pus and albumin and colon bacilli in acid urine. Potassium citrate advised, gr. xx every three hours. Indifferently administered by parents, and urotropin substituted by attending physician. No improvement. Advised potassium citrate again and autogenous vaccine, on second consultation. Refused vaccine, and general attitude on part of parents skeptical as to treatment. Physician lacked force to carry out ideas. Dismissed. Result: Treated by a homeopath and died three weeks later.

Case 6.—Seen with Dr. C. Female infant, very ill with high fever and gastrointestinal symptoms. Treated for "gastroenteritis." Urinary examination revealed the evidences of pyelitis, and case made uneventful recovery with potassium citrate, gr. xx every three hours.

Case 7.—Baby P., male, aged 4, son of physician, ill for one year with irregular fever and its concomitant nutritional features. Physical examination only showed a pus-laden acid urine with colon bacilli. Citrate of potassium, hexamethylamine and autogenous vaccine were not helpful, although none was tried in my judgement sufficiently long. Later operated upon, and abscess of one kidney and of the pelvis of the kidney found. Recovered.

Case 8.—Male, aged 3, referred for treatment by Dr. A. of Reading. Complaint, irregular fever, anorexia, malaise, etc. Ill for two months. Urinary examination made plain pyelitis. Recovered under potassium citrate and autogenous vaccine.

CONCLUSIONS.

From this clinical study the following conclusions seem inevitable:

1. Pyelitis is a common disease of infancy and childhood.
2. It is more common in females.
3. Most cases depend upon infection by the *B. coli communis*.
4. The disease is most often mistaken, especially in infants, for "gastroenteritis," but may go on unrecognized for weeks and

be confounded with, or in fact may resemble, a variety of other common diseases of infancy and childhood.

5. The diagnosis may only be made by a routine study of the urine, which shows pus, albumin, and commonly the colon bacilli, and is acid in reaction.

6. No case of illness should be regarded as having been carefully studied unless the urine has been examined.

7. Treatment consists in the administration of either potassium citrate or sodium bicarbonate in dose sufficient to keep the urine alkaline. To be permanently successful the alkaline reaction of the urine must be maintained for some time, especially if the colon bacillus be the infecting agent. The patient meanwhile must be carefully watched for the first evidence of alkalinosis. Hexamethylamine may do some good, but rarely, and must be given with sodium benzoate to insure acidity of the urine.

8. Autogenous vaccines may be of some help.

9. Relapses are treated as primary attacks.

10. Cases that are clinically well and which still show pus and bacilli in the urine, and which resist all treatment, should be studied with the cystoscope and ureteral catheter.

11. Juvenile cystoscopy and ureteral catheterization are very much neglected arts of the genito-urinary surgeon and need developing.

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A Series of Cases Illustrating the Use of Various Tests in the Study of Renal Diseases¹

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Introduction.—The present report is an endeavor to present a series of illustrative and typical cases of various forms of nephritis, grouped according to their prominent clinical features, in which careful studies of the blood chemistry, specific gravity, fixation determination, urea test, and phenolsulphonephthalein tests were made, with a view to determine their value, relative and absolute, and the correlation which they may show with clinical findings and ordinary urine examinations.

Certain facts regarded as having a practical bearing upon the etiology, diagnosis, and course of renal disease are indicated in the case reports. The cases are presented in groups, according to the following plan of classification:

Group I. Bichloride of mercury poisoning, with acute nephritis.

Group II. Primary acute nephritis.

Group III. Acute intercurrent nephritis, an important clinical group, many individual cases of which are often thought to be primary.

Group IV. Chronic nephritis with cardiovascular disease, the largest and most important clinical group encountered in medical practice, showing many variations and combinations of different degrees and manifestations.

Group V. Chronic nephritis with uremia, illustrating both acute and chronic forms of the latter.

GROUP I. ACUTE NEPHRITIS FROM BICHLORIDE OF MERCURY.

Case 1.—T. B., female, aged 23, admitted to the hospital twenty minutes after swallowing two tablets of bichloride of mercury.

There was total suppression of urine for the first two days; on the third day the urine totaled 400 Cc., and contained a decided trace of albumin, many white blood cells, but no red blood cells or casts. On the seventh, ninth and tenth days both white and red blood cells were present in large numbers, with occasional casts. The urine increased to 2500 Cc. on the fifth day; the specific gravity was constantly low. Clinically, the nephritis would be estimated as of moderate severity. The phenolsulphonephthalein output for the two-hour period was 40 per cent on the fourth day, and 50 per cent on discharge, two weeks after admission. The blood nitrogen did not exceed normal limits. Judged by both clinical results and functional tests, recovery was satisfactory in this case.

Case 2.—W. T., male, aged 40, came under observation thirty minutes after swallowing eleven tablets of mercury bichloride. Suppression of urine did not occur. The daily amount ranged from 700 Cc. to 1500 Cc. On the fifth day a light cloud of albumin appeared, but no red blood cells or casts were found at any time. The nephritis would be classed clinically as of mild degree. The functional tests closely correlated with the clinical estimate and were as follows:

Phenolsulphonephthalein test on the fifth day, 40 per cent.

Blood nitrogen, slightly above normal amounts.

The two-hour urine test showed a slight tendency to fixation of the specific gravity.

The amount of night urine was high in comparison with the amount excreted during the day.

He was discharged twenty-four days after admission, without symptoms, a

¹Read before the Philadelphia County Medical Society, March 21st, 1921.

phenolsulphonephthalein output of 50 per cent, and the other tests indicating nearly normal renal function.

Case 3.—C. F., male, aged 26, reached the accident ward one hour after taking two tablets of bichloride of mercury. The first day's urine was 2500 Cc.; the second day 1600 Cc., followed by suppression for the succeeding six days. Until his death on the ninth day he was mentally clear, and without uremic symptoms.

The second day's urine showed a cloud of albumin and many granular casts. The non-protein nitrogen, estimated on the third day, gave a total of 117 mg.; the urea nitrogen being 66 mg., and the creatinine 4.1 mg. Again estimated on the eighth day, the total non-protein nitrogen was 246 mg.; urea nitrogen, 148 mg.; creatinine, 6.

Discussion.—In all three cases, burning gastric pain, vomiting, and the evidences of marked corrosive effects upon the mucous membranes were present. In the first two cases vomiting ceased after the second day; in the fatal case it continued and became more severe. From the ordinary clinical standpoint cases 1 and 2 would be regarded as completely recovered, although the phenolsulphonephthalein test indicated slightly impaired function. The fatal termination in the third case, without mental, nervous or other uremic symptoms, but with a nitrogen retention of high grade, would support the view that uremia is not due to the presence of nitrogen bodies in the blood in increased amount, but must be caused by some other agency.

GROUP II. PRIMARY ACUTE NEPHRITIS.

Case 4.—S. R., a previously healthy girl of 13, following an attack of acute tonsillitis, rapidly developed scanty urine, edema of the feet and face, and mental dulness. She was admitted to the hospital on the ninth day of the disease. During the next twenty-four hours the urinary output was 100 Cc.; in the two succeeding twenty-four-hour periods the amount increased to 500 Cc. and 1700 Cc. There were a decided trace of albumin, many white blood cells, and granular casts. Clinical diagnosis:

moderately severe acute glomerulonephritis, with edema, following tonsillitis. On discharge she continued to show albumin and casts. On the third hospital day, and twelve days after the onset, the results of various tests were as follows:

Phenolsulphonephthalein elimination, 50 per cent; this percentage did not increase in subsequent tests.

Total non-protein nitrogen, 78 mg.; urea nitrogen, 49 mg.; creatinine, 1 mg.; one month later the blood findings were normal.

Urine urea concentration test, 1.6 on the eighteenth day.

Two-hour specific gravity determination showed fairly marked fixation.

The ratio of night to day urine was low, and remained unchanged with clinical improvement.

The blood-pressure fell from 148/80 to 110/66.

The bodily weight fell from 96 to 76 pounds, with the disappearance of dropsy.

Discussion.—The first impression created by the history and symptoms of the case would be that of an ordinary acute nephritis with edema. More careful study suggests a chronic basis. An absence of red blood cells is of some significance. A phthalein output of 50 per cent unchanged in the subsequent course also suggests an underlying antecedent chronic process. The high blood nitrogen concentration was doubtless the result of diminished urinary secretion, often an important factor in the production of this finding. The most important clues to the recognition of the true nature of the process were the two-hour fixation test and the increase in the amount of night urine above normal, both of which findings remained constant throughout the course, and persisted at the time of discharge. The final analysis strongly suggests an acute nephritis intercurrent in the course of a chronic condition. A loss of more than twenty per cent of the total body weight in a patient with moderate edema emphasizes the importance of internal "waterlogging," from fluid retention, and the fallacy of placing too much reliance upon the absence of edema in excluding

such retention. Ambard has shown that at least 6 liters of fluid may be retained before there is appreciable edema.

GROUP III. ACUTE INTERCURRENT NEPHRITIS.

Case 6.—M. H., an overgrown boy of 16, presented, on admission, marked pallor, well-developed edema of the legs and over the sacrum, coincident with acute suppurative otitis media. He complained of extreme weakness. There was a history of frequent headaches for many years, cough, a lack of endurance, and intermittent swelling of the ankles. Cardiac hypertrophy, arterial sclerosis, and hypertension were present. The urine showed a cloud of albumin, many red and white blood cells, but only an occasional hyaline cast. The history, anatomical changes, symptoms and signs seemed to justify the diagnosis of chronic diffuse nephritis, with an acute exacerbation. The treatment was largely dietetic. He was discharged after three months' observation, symptomatically much improved, resumed his occupation, and was still at work one month later.

The phthalein test yielded 45 per cent on admission, 60 per cent two weeks later, and 30 per cent on discharge. The blood nitrogen fell within normal limits on admission, but at discharge there were total non-protein nitrogen 50 mg., urea nitrogen 25 mg., creatinine 1 mg. The two-hour specific gravity determination showed moderate fixation at low levels. The blood-pressure ranged from 140/86 on admission to 160/110 on discharge. There was a loss of 26 pounds in the body weight, chiefly, if not entirely, due to fluid elimination.

Discussion.—The clinical picture was that of a severe grade of acute nephritis superimposed upon well-advanced chronic lesions. The functional tests at first seemed at variance with the unmistakable clinical evidence. The specific gravity fixation apparently was the most constantly illuminating; the phthalein and blood chemistry findings gave tardy evidence of renal impairment. The urinary findings were typical of severe nephritis except for the absence of casts in any considerable number,

an absence to be explained perhaps by an unusual distribution and character of the lesions.

Case 7.—C. B., a male, aged 48, following acute tonsillitis, developed pain in the calves of the legs, shortness of breath, and swelling of the lower extremities. There were cardiac hypertrophy, arterial thickening, and a systolic blood-pressure of 170. The urine was normal in quantity; specific gravity, 1016; a decided trace of albumin; many red and white blood cells and numerous casts. The clinical data suggested a moderately severe acute intercurrent nephritis of toxic origin. The functional tests indicated a more severe impairment than was denoted by the clinical evidences.

The phthalein test was 40 per cent, both on admission and discharge.

Blood nitrogen slightly above normal limits.

The quantity of night urine equaled or exceeded the amount of day urine.

There was rather marked fixation of the specific gravity in the two-hourly and night urine.

Urine urea concentration, 1.5 per cent. The patient made satisfactory improvement, and was discharged without symptoms six weeks after admission. Two weeks later the urine still revealed albumin and red blood cells, but no casts.

From an ordinary clinical standpoint, the case presented would be classed as one of only moderate severity. However, the specific gravity fixation, high night urine, and low urea concentration would class the case functionally as one of more severe character. This case is in marked contrast to the previous one, in which reverse conditions were shown.

Case 8.—R. L., a boy of 12. The diagnosis was intercurrent acute nephritis with uremia. There were diminished urine, stupor, dyspnea, and persistent vomiting, edema of the face and extremities. The urine showed a heavy cloud of albumin, many casts, red and white blood cells.

Phthalein output, 15 per cent. The two-hour test showed low specific gravity and moderate fixation with restricted output.

The night and day urine were equal in amount. Urea concentration, 1.1 per cent.

Discharged three weeks later; he was without toxic effects, and symptomatically much improved. The functional tests, however, gave clear indications as to the degree of permanent damage and ultimate outlook. Phthalein output of only 20 per cent, blood nitrogen 42 mg., urea nitrogen 24 mg., creatinine 2 mg., and the presence of blood cells and albumin gave somewhat contradictory indications and show the error into which one may be led by placing too great reliance upon one test. The occurrence of severe uremic symptoms with only slight nitrogen retention would indicate the absence of a definite causal relation between them. The creatinine concentration of two milligrammes is of importance and may be considered as a retention effect of particular prognostic significance in this case.

Case 9.—P. B., a large muscular miner of 45, showed edema of feet, legs, sacral region, and face. These symptoms had developed one month before, following suppurative tonsillitis. There were the evidences of advanced arterial sclerosis and cardiac hypertrophy; the blood tension was 220/110; there were impaired resonance and moist breathing at the bases of both lungs. The urine showed a normal specific gravity, a large amount of albumin, and many hyaline and granular casts. He made remarkably rapid improvement, and was discharged subjectively and symptomatically well after two weeks' treatment. The phthalein output on admission was 35 per cent, on discharge 45 per cent. Non-protein nitrogen, 57 mg.; urea nitrogen, 28 mg.; creatinine, 1.2 mg.; on discharge the amounts had fallen to normal. The day-night urine amounts were 600 to 500 Cc. on admission; 1100 to 400 Cc. on discharge. The two-hour test showed some tendency to fixation of the specific gravity, which was constantly low. The urea concentration was 1.5 per cent. At discharge the urine was almost normal; two weeks later it was entirely clear. With improvement the blood-pressure fell from 220/110 to 150/80.

Discussion.—The intercurrent nature of the acute nephritis seemed established by the history and associated signs. This case is one showing a rather close correlation between the clinical evidences and the laboratory findings. Clinical improvement was accompanied by corresponding changes in the functional test. The phthalein test alone persisted beyond convalescence to reveal the presence of a chronic renal process.

GROUP IV. CHRONIC NEPHRITIS WITH ASSOCIATED CARDIOVASCULAR DISEASE.

Case 10.—A. H., a spare-built policeman of 39, without symptoms and unaware of any disability, upon routine examination revealed an albuminuria of slight degree, hyaline and granular tube casts. He gave a history of acute nephritis with edema five years before, but had since been in good health, and worked without interruption. The blood-pressure was 160/130; later it dropped to 120/80; there was severe mouth infection, energetically treated and relieved during the period of twenty-five days' observation. The case represents the type of a seemingly healthy individual in whom a trace of albumin and a few tube casts are accidentally discovered, and usually regarded as of no great consequence. The functional tests pointed to a different conclusion. The phthalein excretion was 35 per cent, rising later to 40 per cent. The blood non-protein nitrogen was 46 mg. The two-hour test showed some fixation with normal specific gravity. The night urine was at first relatively high, but later assumed a nearly normal ratio.

This case is one in which there were no symptoms whatever to attract attention to the kidneys of an active man. The hypertension and slight urinary findings were evidences of damage, the extent of which was revealed only by a careful determination by exact methods. With the removal of the mouth infection he gained five pounds in weight, the urine was clear of albumin and casts, at least transitorially, the phthalein output rose 5 per cent, and night urine concentration reestablished itself.

Permanent damage evidenced itself in the low phthalein output.

Case 14.—L. S., a pale, thin woman of 38, became suddenly dizzy on the street, and rapidly developed unconsciousness before she could be brought to the hospital. On admission there were marked pulmonary edema, gasping respirations, and complete unconsciousness. Her condition was urgent and alarming. Venesection, and the withdrawal of 26 ounces of blood, resulted in marked improvement. There were definite signs of grave arterial sclerosis, and marked cardiac hypertrophy. The blood-pressure was 240/150. She gave a history of attacks of dizziness and headaches beginning three months before. The urine showed a heavy cloud of albumin, a specific gravity of 1010, but no casts, findings which might easily result from acute cardiac failure and hypertension, especially as she made a satisfactory recovery from the acute condition. The functional tests, with only a faint trace of albumin, however, clearly demonstrated a marked degree of renal damage in addition to the other anatomical changes. They were as follows:

Phthalein output 40 per cent, later reaching 45 per cent.

Non-protein nitrogen, 71 mg.; urea nitrogen, 42 mg.; creatinine, 1.5 mg.

The night urine compared with the amount of the day urine was disproportionately large in amount. The specific gravity was low, and varied within narrow limits. Urea concentration test gave 1.6 per cent.

The patient was discharged and remained subjectively well for more than three months. She was brought to the emergency ward with acute symptoms almost identical with those of the previous attack, was bled with apparent benefit, then suddenly complained of chest pain, and died in a few minutes from acute heart failure. The autopsy showed diffuse arteriosclerosis with general nodular involvement of the aorta, a marked grade of cardiac hypertrophy, and contracted kidneys of extreme grade.

Case 16.—A. T., a musician of 47, complained of blurred vision, burning pain over

the entire left side, and inability to concentrate the attention. Eighteen months previously convulsions, unconsciousness, and loss of power on the left side had occurred. Motion was rapidly regained, but burning, stinging pain, with numbness, had developed. The arteries were sclerotic, the heart hypertrophied, the blood-pressure 230/130; the urine was of low specific gravity, and contained a very faint trace of albumin, but no casts. The eye grounds showed little change. Cardiovascular disease, with hypertension, was clearly evident. The history indicated uremia, and the urine pointed to contracted kidneys. The functional tests were not in accord with the clinical conclusions as regards the severity of the nephritis. Phthalein elimination varied from 50 to 60 per cent; the blood nitrogen was normal; the two-hour test showed but slight tendency to fixation of the specific gravity. The kidney involvement was less severe than the clinical analysis would indicate. The possibility of arterial spasm rather than uremia seemed to account for his previous convulsions; unconsciousness and loss of power might be considered in view of the mild derangement of kidney function.

GROUP V. CHRONIC NEPHRITIS WITH UREMIA.

Case 19.—J. G., aged 53, admitted with urgent dyspnea, Cheyne-Stokes breathing, pain, nausea and vomiting, following influenza. There were cardiac hypertrophy and a blood-pressure of 210/110. The daily output of urine was 300 Cc. It was of low specific gravity, contained a cloud of albumin, and many granular casts. The diagnosis was cardiovascular renal disease with uremia.

The phthalein output was 40 per cent; the blood nitrogen normal; serial determination of the specific gravity showed a slight tendency to fixation. The amount of the night urine equaled that of the day urine, and the ratio remained unaltered. The urinary findings and clinical toxic symptoms indicated a much severer grade of renal failure than was revealed by the functional

tests. An unapparent cardiac failure may account, in part, for the urinary findings. He made a satisfactory recovery, and was discharged one month later with a much lowered blood-pressure (160/120).

Case 20.—G. R., a prematurely old man of 39, with well-evidenced cardiovascular disease; when first seen exhibited dyspnea, Cheyne-Stokes breathing, weakness, nausea, mental dulness, confusion, and edema, all of more or less progressive development over a number of days. The blood-pressure was over 200. The urine was scanty, specific gravity 1018, and showed a heavy cloud of albumin, hyaline and granular tube casts. The condition was recognized to be one of gradually developing uremia in chronic nephritis and cardiovascular disease of advanced grade.

Phthalein elimination, 25 per cent; later with improvement it reached 30 per cent. Non-protein nitrogen, 58 mg.; urea nitrogen, 29 mg.; creatinine, 1.33 mg.

After three weeks' active treatment he felt sufficiently improved to resume his occupation as a hotel clerk. The functional tests indicated little real improvement. He was readmitted two weeks later with a recurrence of his former symptoms, rapidly became comatose, and died six days later without convulsive seizures.

The blood-pressure at the second admission was 144/82, but rapidly rose to 200/150. The phthalein output was 20 per cent; the non-protein nitrogen, 81 mg.; urea nitrogen, 32 mg.; creatinine, 2 mg., two days before death.

This patient was one in whom the severity of the renal disorder could easily be estimated from either the clinical evidences or the special findings.

Case 21.—A. Andrews, a prematurely aged man of 46, had long suffered from severe headaches, attacks of vertigo, and nocturnal polyuria. Arterial sclerosis and cardiac hypertrophy were marked. The blood Wassermann reaction was 4+. Blood-pressure, 230/138. There was albuminuric retinitis. The urine examination showed a specific gravity of 1010, normal quantity, a light cloud of albumin, and a few granular

casts. The patient represented an advanced stage of cardiovascular renal disease, with tertiary syphilis. He was under observation for several months, and made no improvement. The terminal events were of brief duration, and consisted of anasarca and uremic symptoms—nausea, vomiting, severe headache, dimness of vision, restlessness, stupor, coma and death.

Previous to the development of the fatal symptoms he had shown a phthalein elimination of 25 to 30 per cent; non-protein nitrogen, 61 mg.; urea nitrogen, 46 mg.; creatinine, 1.8 mg. Later the amounts rose to slightly higher levels. The urea urinary concentration test yielded 1.6 per cent; the two-hour test of specific gravity showed marked fixation at a low level; the night urine was relatively high throughout.

In the two fatal cases terminating with uremic symptoms—one of an acute type, the other of a chronic variety—the blood nitrogen concentration was not great, as might have been expected from the severe clinical types which they represented.

SUMMARY OF CONCLUSIONS.

1. The ordinary examination of the urine does not give dependable evidences of renal disease.

- (a) In many cases the examination of the urine yields almost negative results in the presence of marked functional impairment.

- (b) In other cases the urinary findings indicate marked disease, which conclusion is not supported by functional tests. Renal lesions of a focal or patchy character, or an extrarenal influence, as cardiac failure, may be the explanation of the contradictory findings.

- (c) A few cases were discharged much improved, both clinically and functionally, in whom there were marked and persistent urinary findings.

2. In the ordinary examination of urine, slight findings with a low specific gravity are of more significance than more marked changes with a high specific gravity.

3. The symptoms of renal disease, while of very definite diagnostic value, are not an

absolute indication of the degree of functional impairment. This statement is especially applicable to the cases of moderate severity.

Twenty-two of twenty-five cases observed were symptomatically much improved, while only eight were improved both functionally and symptomatically.

4. The functional tests are a more exact means of estimating the prognosis than by either the clinical symptoms or the examination of the urine.

5. The functional tests are the best guide as to the subsequent management of the case.

6. The estimation of the blood nitrogen is of value only in cases of advanced nephritis. In all of our cases, except two, the blood nitrogen was increased only with a reduction of the phthalein output to 40 per cent, or less. Based upon his experiments upon dogs, McNider concluded that nitrogen retention does not occur until the phthalein output is diminished to 48 per cent.

7. Some investigators place the normal creatinine finding as high as 2.5 mg. per 100 Cc. In our three fatal cases, only one gave a value above 2.5 mg. Several of the particularly severe cases showed creatinine at about 2 mg., and on discharge the amount was unaltered, or even slightly increased; this finding occurred in cases improved clinically, and in the presence of a reduction in the other nitrogen elements of the blood. Most of our cases had a creatinine content of 1 mg. to 1.2 mg. Those cases in which high values occur should receive a more guarded prognosis.

8. Uremia and uremic symptoms are not dependent upon nitrogen retention.

(a) In acute nephritis with severe uremic symptoms (Case 8) the blood nitrogen elements were only slightly increased.

(b) In Case 19, with well-developed uremia, the blood nitrogen was normal.

(c) In our two fatal cases of uremia there was only a moderate increase in the blood nitrogen.

(d) In the fatal case of mercury poison-

ing the blood nitrogen was greatly increased, but uremic symptoms were absent.

9. Nocturnal polyuria is an important early symptom of nephritis. A disturbance of the normal ratio between the amounts of the night and day urine occurs relatively early; with improvement there is a tendency to resume the normal ratio. An estimation of this ratio is of value.

10. The urea concentration test is of value in hospital work, but the test is comparatively recent, and additional data must be accumulated before its general acceptance will be justified.

11. It is evident from a study of the results of functional tests in various cases that in some instances they do not satisfactorily determine the renal status. Occasionally unmistakable clinical evidence is not in accord with the functional tests. On the other hand, the functional tests may evidence much greater impairment than is shown clinically.

In many of our cases we found that the different functional tests did not yield uniform indications of impairment, or that the results were disproportionate. It would appear, therefore, that the best results are to be accomplished by the use of more than one test instituted at various periods, and that the results of each be considered in a final analysis.

12. From the standpoints of both availability and reliability, the best test is the phenolsulphonaphthalein. It has proven accurate and reliable; it is easily carried out in both hospital and private practice. The two-hour fixation test has seemed to us the test of second choice; in some cases, indeed, the first choice. It also has the merit of availability, as well as dependability. It is more useful in detecting chronic contracted kidney, the most frequent form of renal disease.

13. *Clinical Observations.*—Many cases of acute nephritis which are apparently primary are, in fact, intercurrent, the chronic disease being unsuspected, and resulting in lowered resistance and susceptibility to infection. The importance of a knowledge of these facts bears upon the

future management. Cardiac failure or weakness developing in the presence of only moderately advanced renal disease may result in marked renal disturbance without obtrusive evidences of cardiac failure. Clinical observations would seem to indicate that blood-pressure varies with the renal function, tending to rise with impairment, and fall with improvement, provided the cardiac factor remains constant. This is

particularly true in the more acute cases and in the chronic cases of moderate degree. When the renal destruction is severe and of long standing, with associated cardiovascular change, the pressure is apt to be but little influenced.

Valuable references to the literature of this subject will be found appended to the first part of this communication published in the GAZETTE for June, 1921.

A Clinic at the Jefferson Medical College Hospital

BY HOBART AMORY HARE, M.D.

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The first patient that I am bringing before you to-day has presented in the course of her illness a number of conditions which have made a diagnosis difficult, and which have raised interesting questions as to the method of treatment which should be pursued.

Suffering from an attack of quinsy, or suppurative tonsillitis, she was subjected outside of this hospital to a double tonsillectomy, after the suppuration had largely ceased. Four weeks later she entered this institution with a temperature of 102.5°, complaining of severe pain in the right side, which, according to her description, was more below the diaphragm than above it, a rapid pulse, a leucocyte count of 22,000, and evidently severely ill. There was some fixation of the muscles on the right side of the abdomen, and the opinion was expressed on the part of two or more examiners that she was suffering from an appendicitis and that an operation should be performed. The fact, however, that no marked tenderness could be developed in the neighborhood of the appendix, and that she seemed to have more pain when palpation was gradually exercised in the right upper quadrant, raised the question as to whether she might have an infected gall-bladder, but this seemed to be excluded by her age, which is about twenty, and by

reason of the fact that there was no definite point of tenderness in the gall-bladder region. On taking a full breath during palpation she complained of sharp pain outside of the gall-bladder area and the lower pole of the right kidney could be felt, and when it was felt there was a marked increase in the pain. This led to the belief that she might have a perinephritic abscess or an abscess in the kidney itself, and the question was considered whether she should not be subjected to an operation which would be admittedly largely exploratory, with the idea of centering finally upon the appendix, gall-bladder, or kidney. The general systemic condition of the patient, however, was so bad that it was thought wise to wait for twenty-four hours, the more so as at this time she developed an area of dulness in the right lung between the upper and middle lobe, some fine râles, and some tubular breathing. This pulmonary condition seemed to contraindicate the use of ether, and it was suggested that operation should be done under local anesthesia.

In view of the uncertainty as to the locality of the lesion below the diaphragm, it was decided that masterly inactivity for the time being was the wisest course. She seemed desperately ill for two or three days, but at the end of that time she sud-

denly spat up a very considerable amount of foul pus, with the result that all her symptoms immediately moderated and her temperature fell approximately to normal. This condition persisted for a number of days, when there was again a rise of temperature in which curves characteristic of sepsis were present, there being with this rise of temperature an arrest of expectoration. Again there was discharge of pus from the mouth and again the temperature dropped. This happened on no less than three or four occasions.

I should have told you that the *x*-ray examination made as soon as we discovered signs in the lungs revealed either an interlobar abscess close to the mediastinum or a suppurating lymph node.

After a severe illness of several weeks the girl's temperature became permanently normal, and she was discharged from the hospital to go to a convalescent home in the country.

It is interesting to note that a few months later the girl returned to the hospital weighing more than ever before, having gained twenty-five pounds, and the picture of health, with a normal temperature. The cause of her return, however, was a recrudescence of discomfort in her chest, with some cough, but no fever. She is now in the wards a second time for study and observation, with a normal leucocyte count, but with a shadow persisting in her chest in the area described, which may be due to the results of the old infection or to an encapsulated mass of pus.

Here we have an illustration of two points which are of considerable importance, namely, conservatism in dealing with patients who are desperately ill, and secondly, the noteworthy fact that many of these patients who have moderate sized purulent accumulations in juxtaposition to the larger bronchial tubes often, if not in the majority of cases, obtain relief by rupture of the abscess into the tube, which is nature's method of drainage, and although ultimate recovery does not take place in all of these cases, my experience has been that more of them recover than

when a radical operation for pulmonary abscess is attempted. As a matter of fact we should, I think, be guided in these cases more by the general condition of the patient than by what the physical signs or *x*-ray may reveal.

Many things *can* be done, only a few things ought to be done, and in some cases nothing should be done.

A final point in regard to this patient is that pulmonary abscess or infections in the chest are by no means unusual after operating upon septic tonsils.

Subsequently this patient developed a second period of persistent septic fever, with expectoration of pus, and became so ill that operation was performed, consisting of incision, drainage, and later the use of Dakin's solution. Gradual but complete recovery ensued.

The second case, somewhat allied to the first, presents physical signs in the chest which are practically identical, although her history is very different. She does not seem to be as acutely ill as the first patient seemed to be, but is exceedingly pallid and feeble. Her history is that two months ago she suffered from such a severe postpartum hemorrhage that her life was despaired of and she was saved only by intravenous injection. Subsequently she developed cough and is now bringing up sputum, which, like that of the first patient, has a disagreeable odor. She also is running a temperature, which is indicative of septic absorption, and again the *x*-ray seems to indicate an interlobar accumulation of fluid or pus. Her hemoglobin is less than 40 per cent, and this condition alone forbids any consideration of operative interference even if her general state of nutrition seemed to make it permissible. Her great feebleness is another reason for deciding that "watchful waiting" with proper supporting treatment and hypodermic injections of cacodylate of sodium with small doses of iron internally for her anemia is the best course to be pursued, in association with as much forced feeding as her digestion will permit.

The question naturally arises as to why she should have developed this pulmonary condition following a postpartum hemorrhage. Of course, one naturally thinks of a pulmonary embolus, but she has had no evidence of pulmonary infarction, and pulmonary embolism complicating labor, as you know, is exceedingly fatal. Nevertheless this possibility cannot be excluded.

Later.—After this patient had been under observation for three weeks more it was found that she had tubercle bacilli in her sputum, and the probabilities are that it was not a true case of interlobar empyema, but one of tuberculous infection of a low grade which had been present for a long time and which flared up when her pregnancy was completed and she suffered from the severe anemia which her postpartum hemorrhage induced.

The third case is a man who, as you see, has a very marked enlargement of the thyroid gland. He is, however, devoid of exophthalmos and the other symptoms which are so characteristic of exophthalmic goitre. Palpation of the gland shows that it is soft and in some parts fluctuating, and therefore would appear to contain fluid. The left lobe, however, which is the smaller of the two, is quite firm and feels as if it had a very considerable mass inside of it. He presents himself for treatment not only because of the disfiguring effects of the enlargement, but because there is some pressure upon his trachea. It is important in these cases to remember that sometimes a goitre ultimately becomes an exophthalmic goitre, and it is also important to remember that this probably occurs much more frequently when there is true adenomatosis in the thyroid gland than when there is enlargement alone.

As you all know, an immense amount of work has been done in regard to the thyroid during the last fifteen or twenty years. While in some instances the conclusions reached have been based upon insufficient evidence, there can be no doubt that our conception of thyroid disturbances is infinitely better than it was ten years ago.

Some of the points which deserve emphasis and recognition on your part, or for you to recall, are, first, that in every case of exophthalmic goitre there is hypertrophy of the parenchyma of the gland, although in some instances the gland still remains so small that it is overlooked as the cause of the patient's symptoms. Largely through the investigations of Plummer, although many others have been busily engaged along the same lines, we must recognize at least two distinct clinical types of hyperthyroidism. The second type is that in which, as we have already said, there is adenoma. There may also be an intermediate type between that in which there is excessive secretion of thyroid alone and the adenomatous type to which we have just referred, in which there is also excessive secretion. The adenomatous type, contrary to what one would imagine, is often characterized by comparatively slight enlargement of the gland.

Boothby, who has well summarized some of the points of difference, points out that enlargement of the thyroid is usually noted from five to ten years earlier in life by patients with the adenomatous type than by patients with the hyperplastic exophthalmic type. So, too, in the latter form the symptoms of excessive thyroid secretion usually develop within less than a year after enlargement of the gland is noted, while in his experience fourteen and a half years elapsed before the development of symptoms of thyroid intoxication in the adenomatous type. There is, therefore, in this patient a distinct danger of his developing the symptoms of thyrotoxicosis in the near future.

Exophthalmos is a very much more constant symptom of the hyperplastic type of goitre than it is in the adenomatous type.

It is interesting to note, too, that gastrointestinal crises, thrills and bruits which are so common in the hyperplastic type are usually absent in the adenomatous type. Finally, it is well to remember that the onset of symptoms of the adenomatous type is not only slow, but often exceedingly gradual and insidious, so that an erroneous

diagnosis as to the cause of the patient's impairment of health and lack of energy is frequently made. In both types there is a marked increase in the basic metabolic rate due to the excess of thyroid secretion in the body.

An important aid in the differential diagnosis is to be found in the fact that the systolic blood-pressure in the adenomatous cases is much higher than it is in ordinary hyperthyroidism. This is also true of the diastolic pressure. In ordinary exophthalmic goitre, while there may be in certain cases a high systolic blood-pressure, the diastolic is usually unduly low, indicating relaxed blood-vessels, and so there is an endeavor on the part of the heart to keep the circulatory system full by means of a rapid pulse.

Last of all, it is possible to divide the adenomatous cases into two groups. In one there is a marked increase in basal metabolism and in the other basal metabolism is nearly normal.

I shall refer this case to one of the professors of surgery; first, because operation for an ordinary enlargement of the thyroid which is sufficiently great to produce symptoms is usually a wise procedure, and secondly, because in all probability the patient will ultimately develop symptoms of hyperthyroidism, and it is wise to resort to conservative surgical measures at this time to forestall such a complication.

Non-specific Protein Therapy in Arthritis.

In the *Journal of the American Medical Association* of January 29, 1921, COWIE states that unquestioned relief from pain will often follow protein therapy, even though the focus of infection is not removed, and in some cases, in addition to improvement in the joint condition, the focus itself may cease to be active.

So far as we know at present, foreign protein acts by combating infection. If we regard, as many clinicians do, the large majority of joint diseases as due to infec-

tion and only comparatively few as due to metabolic disturbances, it may be said that foreign protein therapy is not contraindicated in any form of this large group, provided no other forbidding features, such as serious heart disease, are present. It may be argued that, while we may not cure the structural defects or the consequences of the defects, such as muscle atrophy and ankylosis, we may stop the exciting cause and thus arrest the process from further development. But, as a matter of fact, we have not enough trustworthy data at hand to prove that this is so, plausible as it may seem.

Thus far, experience has taught us that acute or subacute processes that have not progressed beyond the first year are the ones that give the best results, particularly those that have not gone on to marked structural change of the articular or peri-articular tissue; next to these, cases which have progressed longer and which may show structural change, but which have not produced definite ankylosis and its consequential results.

He believes that the work that has been done justifies the statement that acute and subacute arthritis and peri-arthritis are the forms which respond more promptly and more surely to this method of treatment. A few cases of chronic arthritis of as long as three years' standing have been recorded in which, apparently, complete cure has followed this method of treatment; and in still more chronic forms unquestioned benefit has occasionally resulted. However, at present there are not enough properly classified cases recorded to enable us to say what percentage of each class is benefited by this method of treatment.

With regard to the frequency of injection it seems to have been shown that no negative phase, so far as the antibody content of the blood is concerned, follows the injection of foreign protein. For this reason we may feel justified in giving daily injections. On the other hand, if we take into consideration the severity of the reaction and the condition of the patient, it is good practice to let a day intervene be-

tween injections. If any benefit is to be secured by this method of treatment, from one to ten injections will suffice. No anaphylactic shock phenomena accompany these injections, even though a second course of treatment may be instituted after several months.

As to choice of foreign protein, it has been shown that sterile albumose solutions, horse serum, and bacterial proteins bring about similar results. At present, bacterial protein seems the protein of choice. Typhoid vaccine is most generally used. A typhoid vaccine can be made up according to well-known rules and preserved in 0.5-per-cent phenol, or a standard stock vaccine may be used.

The severity of the reaction is in a measure proportional to the size of the dose. There is a general impression that the maximum benefit will be derived from a dose just sufficient to give rise to a chill.

Uncompensated cardiac lesions, acute endocarditis or pericarditis should be considered as contraindications. A word of caution may not be out of place. It should be distinctly borne in mind that we are far from an explanation of the manner in which the foreign protein acts, and that only a certain percentage of any form of joint infection is improved. For this reason we must approach a given case with definite conservatism.

[As a type of bacterial proteins the Editor of this Journal uses with much satisfaction phylacogen.—Ed.]

Important Considerations in the Administration of Artificial Pneumothorax.

In the *Journal of the American Medical Association* of January 29, 1921, under the heading of "Correspondence," GAMMONS states that it has been shown that about 50 Cc. of atmospheric air is absorbed by the pleura in twenty-four hours. Taking this fact into consideration, it is a matter of mathematics to determine how often to

give the treatment in the majority of cases. It is obvious that many physicians are not using this treatment properly when, after two or three treatments, they allow an interval of one month to elapse. It is evident that the lung is being exercised more and injured more than if there were no interference whatever.

The object of artificial pneumothorax treatment is to close up ulcerating areas, thereby decreasing pus formation, cough, and toxemia. If we are to do this permanently we must keep constant pressure on the lung. In this way a marked fibrosis results, as has been shown at necropsy. This pressure must be kept up just as long as is possible. In selecting the case for treatment by artificial pneumothorax we must observe our prospective pneumothorax patient long enough to be confident that he will not get better with the usual treatment. We must feel that the compressed lung will not function for the rest of the patient's life if the results of artificial pneumothorax are to be what they should. After the physician has selected his patient, he should give the treatment just as often and in such amounts as to obtain a compression in the shortest time and most aseptic manner possible. The manometer and fluoroscope must be his constant guide.

A procedure which Gammons has found effective is to give 350 Cc. at the first treatment and then give the second treatment of from 400 to 500 Cc. on the third day. He then increases the interval between instillations one day until the patient is taking the treatment once a week. He continues this weekly treatment for at least six months, and then gives one every ten days. The amount to be given after the second instillation will depend on the manometric reading and the fluoroscopic findings. Gradually positive pressure must be obtained even if there is some displacement of diaphragm and mediastinum; but marked embarrassment of respiration must be avoided and the patient must have absolute rest for twenty-four hours following treatments.

Editorial

DECAPSULATION OF THE KIDNEY.

Readers of the *GAZETTE* will remember that from time to time we have discussed this subject in leading articles: first, when Edebohls and Harrison wrote enthusiastically concerning it, and since then on more than one occasion. Comparatively recently we have dealt with the results which were obtained by Morse in Boston, and by English surgeons in three or four cases, two of which were certainly most favorable.

Attention is called to the matter once more by three articles which have appeared in the *Edinburgh Medical Journal*. In one of them Boyd reports the results he has obtained in two cases of subacute diffuse nephritis.

One of them, a man of forty-one, suffered from intense anasarca and breathlessness, with 32 grains to the ounce of albumin, with numerous hyaline and granular casts, and a phenolphthalein excretion of 28 per cent. The amount of urine per day was 20 ounces. The blood-pressure was 130, and there was some cardiac dilatation. The non-protein nitrogen content was 60. Tapping the abdomen and placing the patient on a nitrogen-free diet, salt-free diet, and a dry diet, all failed to produce any benefit, although at various times, after several months, large quantities of liquid were removed by tapping. It was therefore decided to operate, and both kidneys were decapsulated. Very little urine was passed on the day after the operation, but on the following day the patient passed 55 ounces, on the second day 70 ounces, and on the third and fourth days thereafter he averaged 70 to 80 ounces until the edema had disappeared. Ten days after the operation the quantity of albumin fell to 2.2 grains per ounce and the patient continued to improve uninterruptedly. The patient was

discharged in what appears to be from a month to six weeks after operation, passing daily 50 ounces with slight albuminuria. The operation was performed three years ago, and the patient has since then been working uninterruptedly at an easy job and reports that he feels well.

The age of the second patient is not given. He also had general anasarca, marked albuminuria, hematuria, and an enormous number of all sorts of casts. His blood-pressure was low; systolic 79, diastolic 55, the non-protein nitrogen 59 mgr. per cent. Under ordinary treatment he failed to improve, his edema and ascites progressively increased, and failed to be materially benefited by repeated tapings and the use of Southey's tubes. The patient was therefore decapsulated. The day following operation no urine was secreted, but on the second day 20 ounces were passed, on the third day 40 ounces, the fourth day 80 ounces, the fifth day 120 ounces, and this free diuresis continued until edema had almost completely disappeared. Five months after operation the patient apparently was enjoying good health with no albuminuria.

To those who are interested in this subject, we may add that Boyd quotes a considerable amount of literature and gives the various theories which have been advanced to explain the results which follow this procedure. One thing however appears very clear, namely, that the free diuresis which comes on within twenty-four or forty-eight hours after operation cannot be explained by the establishment of a collateral circulation, but rather by the relief of pressure upon the secreting epithelium of the kidney. While Boyd believes that this procedure has a distinct field of usefulness in a limited number of cases, he does not claim for a moment that it is the ideal treatment for all cases of subacute diffuse nephritis. His point of view is

that where the patient is obviously going down-hill with a rising non-protein nitrogen content of the blood and fails to respond to ordinary methods of treatment, the operation should be seriously considered. He clearly points out that either decapsulation or incision of the kidneys cannot be expected to cure chronic interstitial nephritis nor the pathological conditions upon which the kidney changes depend.

Following this article is one by Fowler, who reports three cases. One in a child of seven, who a week before admission to the hospital became anasarca, with a scanty urine, which contained albumin and many granular casts, but there was no blood in the urine. Notwithstanding his stay in the hospital his anasarca increased, and at the end of two weeks he was passing only 4 ounces of urine a day. A salt-free diet, hot packs, and all manner of diuretics failed. When transferred to the surgical service he weighed 70 pounds as compared to 33 pounds before he was attacked. There was fluid in all the serous cavities. Four months after admission the right kidney was stripped, and on the succeeding day he passed 35 ounces of urine, on the seventh day 93 ounces, eighth day 146 ounces, and on the ninth day 157 ounces, the dropsy rapidly disappeared, and with its decrease the urine naturally diminished. The patient continued well and was discharged free from symptoms six weeks after the operation. A year later he was reported as doing well.

The second case, a woman of fifty-six, also suffered from anasarca with a low blood-pressure, marked albuminuria, and granular and hyaline casts. Failing to be relieved by ordinary measures and passing about 16 ounces of urine a day, the right kidney was stripped. Much serum flowed from the wound in the loin, but there was no marked change in her condition until the thirteenth day, when the output of urine rose to 77 ounces and continued uninterruptedly at the rate of about 100 ounces per day, with rapid subsidence of the dropsy. She was discharged from the hospital two and a half months after the

operation free from all symptoms, although the urine still contained small amounts of albumin and a number of casts. Seven months later she reported that she was better than she had been for years and was able to work.

The third case was that of a girl of ten years, in which instance the symptoms were identical, and again only one kidney was stripped. Eleven months after operation the child was reported to be able to go about as usual, but the urine contained a small quantity of albumin.

Fowler's view is that decapsulation of one kidney gives sufficient relief to the symptoms, and therefore is preferable to a double operation at one sitting. It will be recalled that in Boyd's cases the double operation was performed. It would also appear that in Boyd's cases the results were slightly better so far as ultimate results were concerned. It is also evident that it is in subacute parenchymatous nephritis that the best results seem to accrue.

Simpson, in the same journal of the same issue, reports four cases, all of them in children. The first of them had decapsulation of both kidneys at the age of nine years. The patient continued in good health for four years, and then developed some acute infectious condition, and died after a ten days' illness.

The second case was a girl of four years with all the manifestations of well-marked diffuse nephritis, who was subjected to decapsulation of one kidney with marked immediate improvement, without any trace of albumin three weeks afterwards. Ten months later, however, she developed an influenza pneumonia and died.

In the third case, a girl of nine years, decapsulation was performed, but no statement is made as to whether it was double or single. She was discharged one month afterwards with a slight trace of albumin and a little blood in the urine, and has gone on well since, but every now and then has a slight hematuria which requires rest in bed for a week or ten days. At the last examination no casts were found.

The last case reported by Simpson is

that of a boy of nine years with albumin, blood and casts in the urine, who failed to respond to general treatment, and who had one kidney decapsulated with marked improvement by the fourth day. The exact time is not stated, but from a few days to two or three weeks, that is within the same month, the second kidney was decapsulated and the patient kept under observation for two months. During the last three weeks of this period of observation he was up and about like an ordinary child and was discharged from the ward with urine free from albumin.

Fraser reports three additional cases, all of them children between five and ten years of age. In no one of these cases were both kidneys decapsulated at the same time, but at intervals of some weeks. In all of them the results justified the interference, and Fraser believes, as a result of catheterization of the ureters, that the kidney which has been stripped functions better than the other. He also believes that it is advisable in all cases to operate on both kidneys, but asserts that there is no advantage, but rather the reverse, in decapsulating both kidneys at the same time, waiting for the second operation until the effects of the first have been survived.

Manifestly this question of operating on both kidneys at the same time must be decided in each individual case, the judgment of the physician and surgeon in attendance being the important factor as to exactly what ought to be done.

THE EFFECTS OF INJECTIONS OF QUININE AND ITS ADE- QUATE DOSAGE.

A very interesting and valuable contribution to this subject has been made by Dudgeon to the *Journal of the Royal Army Medical Corps*, and as many of our readers practice in districts where malarial fever is prevalent and severe, we feel confident that they will be interested in the conclusions at which he has arrived. He used intramus-

cular injections, employing quinine with olive oil and in creosote and fat. He made cross-sections of muscular tissue into which the injections were made, and also determined the different effects induced by quinine when given to animals which were anemic and to animals which were normal. He also took up for consideration the important question as to whether intramuscular injections of concentrated or dilute solutions of quinine were advisable. He sometimes used intramuscular injections of the alkaloid in 60-per-cent alcohol, studying as well the question of the fixation of quinine in the tissues. Altogether his research may be considered possibly the most exhaustive one which has been made along these lines. It is illustrated by a number of interesting and well-executed plates.

The conclusions reached by Dudgeon are as follows:

1. Concentrated preparations of quinine produce more intense necrosis than dilute, but dilute preparations such as are of practical utility excite edema and necrosis at the site of inoculation. The difference between these two methods of quinine inoculation is not of sufficient value to justify active opposition to the methods commonly employed.

Injection of quinine in solutions so dilute as to avoid edema and tissue necrosis is not of practical utility in the human subject.

2. A concentrated solution of quinine is absorbed rapidly from the tissues as shown by chemical analysis, even in patients who are *in extremis*. It is not apparently stored as such in liver, kidneys, or heart muscle.

3. It is essential to realize that tissue necrosis—spreading edema and local blood destruction—is produced by the solvents employed for quinine administration, and the effects are only slightly inferior to those excited by quinine salts and the alkaloid.

4. No advantage was obtained by the addition of olive oil or fat, or by injecting the alkaloid dissolved in alcohol or ether, whether in concentrated or in a dilute solution.

5. Tissue necrosis occurs immediately

and persists for a considerable period. In some instances the fibromyositis which results is associated with a fibroneuritis which causes various symptoms definitely related to the pathological processes.

6. Necrosis of blood-vessels in the area of inoculation is a common result. This leads to small hemorrhages into the tissues, and has caused severe hemorrhages in the human subject, and experimentally, from rupture of a large vessel. The destruction of the vessel wall is associated with an accompanying thrombosis.

7. An extensive necrosis produced by an intramuscular injection of quinine in the neighborhood of an important nerve trunk may result in nerve palsy. Experimentally, complete degeneration of the great sciatic and other nerves has been produced apart from any direct injury to the nerve at the time of the inoculation. In the human subject this disastrous result may be due to spreading edema and extensive tissue necrosis.

8. Experimentally, no leucocytosis has ever occurred from quinine injections; on the other hand a leucopenia may develop, while an increase of large hyaline cells has been recorded on several occasions.

9. No essential differences in the degree of tissue necrosis from intramuscular injections of quinine in malarial fever or malarial fever associated with blackwater fever were observed.

10. Repeated intramuscular injections of quinine should not be given into the same area of muscle, or tissue directly adjacent, as otherwise permanent injury of muscle or nerves may occur.

In this connection a paper contributed to the London *Lancet* by Sir Patrick Hehir upon "The Quinine Treatment of Malaria" is of interest, the more so as he quotes the results obtained by Johnson and Gilchrist in the German East African campaign. Concerning the administration of large doses in initial attacks, relapses and reinfections, he states that in his opinion this massive form of treatment is probably the greatest improvement made in recent times. Experience in the British army in India shows

that this plan of treatment not only eradicates the disease, but prevents the development of immune parasites. Hehir does not believe that the process of parthenogenesis of the malarial parasites commonly described in books on malaria actually takes place. He has never seen nor has he met with any fellow worker in India who has observed it. He is not willing to go so far as to assert that it does not occur. Of course he believes that the chief effect of the quinine is exercised upon the asexual form, although he is not prepared to state that it has no effect upon the sexual form. He disagrees with the statement that the sexual forms of malarial parasites do not occur in cases of malarial fever untreated by quinine. He agrees with Manson that quinine still holds the premier place as the great remedy for malarial infection, the arsenical preparations, for example, being very inferior to it. He bemoans the fact that some physicians have been afraid to use large doses with the idea that they precipitated attacks of blackwater fever.

While it is true that quinine does maintain its position as being the best remedy, nevertheless it is also evident that it is not by any means always successful, and it is to be hoped that further investigations will reveal some synthetic product which will be still more specific.

Last of all, Hehir points out that every patient who has chills and fever is not necessarily suffering from malaria, and asserts that no such case should be so treated until the parasites are found in the blood. He reports the case of a patient suffering from intermittent pyrexia for twelve days with negative blood findings, in whom it was ultimately found that there existed a putrid alveolar abscess, which on being opened was followed by complete relief, yet this patient had received 360 grains by the mouth and four intramuscular injections of 10 grains each of the bihydrochloride; and again he reports his own case in which he was given 45 grains of quinine daily for three days when suffering from sandfly fever and not malaria.

THE USE OF ADRENALIN IN ADDISON'S DISEASE.

Addison's disease is so rarely met with, even by those who have opportunity for clinical study in connection with large hospitals, that many practitioners fail to see a case in the course of many years' practice. Nevertheless the disease is one which has always aroused interest in the medical profession, partly because of its clinical manifestations and also because the prognosis has seemed so gloomy that an overpowering wish has arisen that some measure could be taken which would arrest the disease and restore health.

In a recent issue of the *Journal of the American Medical Association*, a report has been made of a case of Addison's disease by Muirhead. The interest in his report is greatly increased by the fact that it is an autobiography, the writer himself being a sufferer from this malady. He tells us that at the age of nineteen he enjoyed excellent health, and not long after, as a result of poor food, he suffered from indigestion and a feeling of weariness. In 1892, at an age which he does not give, pus cells were found in his urine, and he suffered from an occasional attack of weakness and general malaise.

Ten years later there were prolonged attacks of much greater severity, and eight years after this he was found to have a practically functionless kidney on the right side, with a systolic pressure of 110 and diastolic of 80. The right kidney was removed and found to be almost entirely destroyed by suppuration, but presented no evidence of tuberculosis. Operative recovery was rapid.

Two years later he suffered from an attack of gout, which was followed by marked prostration with constant nausea and frequent vomiting. The systolic blood-pressure was 90 and the diastolic 70. He developed bronzing of the skin of the hands and face, and a diagnosis of Addison's disease was made. The use of 2 Cc. of 1:1000 solution of adrenalin taken by the mouth produced no apparent effect, nor did the use

of dry suprarenal gland or of dry whole pituitary gland, specially provided, he says, by the laboratory of Parke, Davis & Company, taken by the mouth induce good results. The bronzing of the skin extended to the mucous membranes, and the blood-pressure fell to 82 systolic and 64 diastolic. At this time the use of adrenalin was returned to, but the noteworthy point is that it was now given hypodermically instead of by the mouth. So injected the contents of one ampoule produced marked sensations of exhilaration and increased strength. He therefore received from one-half to one ampoule of 1 Cc. of 1:1000 solution twice daily for a period of six weeks, and 2 Cc. of 1:1000 solution was also given by the rectum twice daily for several months. The point recorded by Muirhead is that improvement was observed almost immediately from the hypodermic injections. He developed increased food tolerance and there was a diminution of abdominal discomfort. While before the injections he could not walk two blocks without extreme weariness and shortness of breath, two weeks later he could walk a mile without much fatigue, the bronzing became less, and his general progress has been good. He has continued the use of the ampoules, using, however, 0.2 Cc. of 1:1000 solution by hypodermic needle, because larger doses cause uneasiness and trembling of the extremities. At present he is able to continue his occupation as a teacher in a medical college without difficulty. The last blood-pressure reading was 92 systolic and 64 diastolic, and he states that he has no doubt that the artificial supply of adrenalin by hypodermic needle aids body function, a statement which is supported by the fact that brief withdrawal recently was followed by some recurrence of symptoms.

We have, therefore, in this case an interesting illustration of the accurate description of symptoms and relief by a patient who is a physician and a professor of pharmacology. His skill in observing the symptoms developing in his own case cannot be denied, nor can the results obtained be gainsaid. The other point of interest

is one upon which we have insisted for many years, namely, that adrenalin by the mouth is so influenced by the gastric juice that it cannot be expected to produce the effects that will accrue if it is given by means of the hypodermic needle.

UNUSUAL FORMS OF POISONING.

Thirty or forty years ago a number of cases of inadvertent poisoning from arsenic occurred from the use of aniline dyes, contaminated with this element, in wall-paper, in clothing, and in candles. Still later, subacute or chronic arsenical poisoning was discovered as a result of drinking beer, which was contaminated by arsenic, and a large number of persons in England suffered in consequence. The medical profession has recognized for years that lead is prone to find its way into the body insidiously and often produces symptoms which are decidedly aberrant. We called attention to this matter comparatively recently.

Now we have a report, by Neuhoﬀ in the *Journal of the Missouri State Medical Association*, of a boy of fifteen, supposedly in perfect health, who was admitted to the hospital an hour and a half after he began to perspire freely as a result of playing ball. He was pale and cyanotic, and thought to be moribund. His pulse was 124, he was covered with a cold sweat, the abdomen was rigid and uniformly tender to touch. He was conscious, but complained of diffuse abdominal pain. An hour and a half later he vomited freely, and from this time on convalescence began, although the next day he felt weak and remained in bed. It was found upon investigation that he had been wearing a pair of shoes which had been dyed with a brand of dye recommended for this purpose, and that he had made the application while they were on his feet. Chemical analysis revealed that this dyestuff contained a large amount of nitrobenzol, and Neuhoﬀ calls attention to the fact that taken internally 7 drops of it cause death.

He also reminds us that Stifel has recently reported seventeen cases of shoe-dye poisoning, and, therefore, it would appear that the matter is of sufficient importance to justify recognition. It is also important to recognize that shoe-dye is not to be confounded with shoe-blackening or shoe-polish. The dye is used only when the purchaser wishes to change the color of the shoe to black when it was primarily tan or russet.

SPLENECTOMY.

An analysis of 245 cases of splenectomy has been made at the Mayo clinic. An analysis, such as is given by this clinic for the purpose of discovering the truth and not for exploitation, is of major importance to the profession from the standard of dealing particularly with those conditions characterized as anemia, hemorrhagic jaundice, and leukemia; conditions which have yielded only occasionally to general sanitary and medicinal measures; which have in some cases given brilliant results following operation; results successful somewhat in proportion to the timeliness of the surgical intervention.

Of these 245 cases 71 were classed as splenic anemia; 10 as septic splenomegaly; hemolytic jaundice 32; 53 as pernicious anemia; 26 as myelogenous leukemia; and 10 as portal cirrhosis.

There were 26 hospital deaths, *i.e.* 10.6 per cent, contributed to in the main by those cases characterized by large adherent spleens and by a tendency to hemorrhage.

Seventy-one cases of splenic anemia gave 9 deaths (12.6 per cent); 32 cases of hemolytic jaundice (3.1 per cent); of pernicious anemia 53 cases with 3 deaths (5.6 per cent); 26 cases of myelogenous leukemia with 1 death (3.8 per cent). The high death-rate incident to cases of splenic anemia is incident in part to the difficulty of the operation due to the splenitis commonly present. Difficulties are encountered in a septic splenomegaly in which a chronic recurring sepsis over a period of years has

resulted in an enlargement of the spleen accompanied by secondary anemia.

Giffin (*Minnesota Medicine*, March, 1921) points out that the first essential fact in regard to splenectomy is that it eliminates the largest lymphoid organ in the body. That the spleen is structurally lymphoid is frequently overlooked in discussions of splenic function, and very little clinical evidence is at hand concerning the effect of splenectomy in conditions associated with lymphocytic hyperplasia. The second outstanding clinical fact with regard to splenectomy is the definite establishment of its remarkable effect in the cure of hemolytic jaundice. It seems most likely that if the spleen has a specific function, this function will be discovered in connection with a study of its activity in hemolytic jaundice. The icterus of hemolytic jaundice is largely the result of increased hemolysis, and hemolysis seems to be intimately related to the function of the liver. Splenectomy can be said to be a symptomatic cure for hemolytic jaundice unless the anemia has been of such long duration and of such severe type that it has assumed the features of a primary anemia, in which event the blood count does not return to normal, but the patient lives indefinitely. A third striking clinical fact concerning the effect of splenectomy in all forms of disease in which splenectomy is associated with a secondary type of anemia is that the anemia itself is less severe after splenectomy than it was before, even though the disease may not have been cured by the operation. In the fourth place removal of a very much enlarged spleen markedly reduces the amount of blood which has to pass through the liver. The removal of a small spleen is of doubtful effect on the liver. If a small spleen associated with an advanced portal cirrhosis is removed the clinical result may not be satisfactory. If the large spleen of splenic anemia which has become associated with an equally advanced portal cirrhosis is removed, the clinical result may be quite remarkable, yet there is no reason definitely to assert that the etiology of the two conditions is essentially different. Fifth, it must

not be entirely overlooked that the removal of an abnormally large spleen may be a relief to the patient from a mechanical standpoint, although this factor alone would rarely lead to a decision for splenectomy.

In regard to splenic anemia, of the 71 cases with 9 hospital deaths 22 later perished; with 17 patients living more than five years after operation. The cause of hospital deaths was thrombosis of the mesenteric vessels, influenza, pneumonia, and pulmonary embolus, and in one instance hemorrhage. The immediate occurrence of localized hematoma and subdiaphragmatic abscess were important factors in protracted convalescence.

The patients who died after hospitalization lived longer than two years.

Hemorrhage in eight cases in the form of hematemesis was the cause of death. In two of these the fatal hemorrhage followed operation by five years and two months. As far as is known postoperative hemorrhage occurred in a total of 14 cases. A demonstration of marked splenic enlargement and evidence that the enlargement of the spleen was primary are essential in the decision for surgical treatment in splenic anemia.

Of the ten cases of septic splenomegaly, but three were living at the time of the report. Besides the two hospital deaths, five deaths from cardiac and renal disease occurred within seven months.

The conclusion seems to be clear that the patient with splenomegaly and anemia, which stimulates splenic anemia, associated with a long history of chronic recurring sepsis, is rarely benefited by splenectomy, probably because there has been previous damage to the function of vital organs which is irreparable. A careful estimation of cardiorenal sufficiency should be made before operation.

Hemolytic jaundice, hemolytic icterus, or acholuric jaundice, is a very clearly defined clinical entity. Whether the cases are familial, congenital, or so-called acquired in type, their clinical manifestations are the same and their characteristics exceptionally well defined—that is, chronic jaundice of

many years' duration; periodical exacerbations usually associated with crises consisting of abdominal distress, headache, and fever, the absence of bile in the urine and its presence in the stools, except at the time of crises, the development of gall-stone colic later in the history, and the finding of an increased fragility of the erythrocytes in the peripheral circulation.

Not infrequently patients whose history of hemolytic jaundice goes back to infancy are constitutionally somewhat delicate and neurotic. It is not surprising then to find that splenectomy has not entirely eliminated the constitutional inferiority which some of these patients possess. The hospital mortality is low, the patients are rapidly cured of jaundice and anemia, and their subsequent health is the good health of the average person.

As to the 53 cases of pernicious anemia, there were but 7 living at the time of the report, 5 of these between four and five years after operation; that is, 20 per cent of the patients lived more than three years, giving a total duration for the disease of more than four years, while 10 per cent of the patients are living almost five years from the date of operation, giving a total duration of the disease of almost six years. These statistics quite definitely indicate a prolongation of life in a certain percentage of the patients. Whether these findings would be sufficient to lead to splenectomy in many cases of pernicious anemia is questionable; on the other hand, it might seem advisable in individual cases, after all aspects of the question have been considered, to decide on splenectomy. Splenectomy will without doubt cause an increased activity of the bone-marrow, and in almost every instance will lead to a remission of at least several months. The operation is certainly not yet to be discarded.

As to the patients with myelogenous leukemia with splenectomies after preliminary treatment with radium, seven patients lived more than three years after operation, and six of these are still living. It has been observed that the patients are less likely to develop severe anemia if they have been

splenectomized. They are also relieved mechanically of the discomfort associated with splenic enlargement; they are much more likely, however, to have great enlargement of the liver, but this enlargement does not seem to be so great a cause of discomfort as marked enlargement of the spleen. The removal of the spleen in very chronic types of myelogenous leukemia in which the organ is fibrous and the leukocyte count never very high may be definitely advisable. In certain other selected cases, in view of all the circumstances, splenectomy may be recommended, but in the great majority of cases of myelogenous leukemia it is of questionable value.

It is probable that every case of marked splenomegaly is associated with a certain degree of cirrhosis of the liver. From the pathologic standpoint cirrhosis of the liver may best be grouped as portal or biliary in type. This classification is satisfactory from the clinical standpoint, although a certain number of cases will be quite definitely mixed in type. The cases classified as portal cirrhosis are those in which there seems to be no question but that the cirrhosis of the liver is the primary and predominant condition. Cases of splenic anemia in the Banti stage are not included. The diagnosis has been made after a consideration of the clinical, the surgical, and, in some instances, the post-mortem findings. Occasionally a case is observed, however, in which it is impossible to determine whether the splenomegaly or the cirrhosis is more marked, and in which the pathologic changes in the spleen and in the liver seem to go hand in hand. Whether there is any essential difference between splenic anemia, septic splenomegaly, Banti's disease, and cirrhosis of the liver remains questionable. Ten cases were grouped as portal cirrhosis. The hospital mortality was very high in this group; four patients died. Three other patients died subsequently within one year of operation. One patient is in fair condition one year following operation; one is living four years following operation.

Biliary cirrhosis is as a rule associated

with an enlarged smooth liver, early jaundice, and slight or moderate splenomegaly. Frequently there is evidence of increased hemolysis. Six cases have been classified in this group; all of these patients are dead. One patient died in the hospital and five have died subsequently.

RIGHT ILIAC FOSSA PAINS AND THE END-RESULTS.

The profession at large has become so habituated to regarding right iliac fossa pain as in itself diagnostic of appendicitis, either acute or chronic, that providing this pain persist, be sufficiently irksome to the patient, or be present in one with a predilection for doctors and operations, it is not surprising that many unreported cases of appendicular operation have been performed without in the slightest degree relieving the pain from which the patient suffered; since there is a distinct percentage of pain thus located due to other causes than those connected with the appendix.

The uniformity with which the pathologist reports the signs of chronic inflammation in the appendices thus removed, without relief of symptoms, suggests either that practically all appendices are chronically inflamed or that the laboratory expert correlates his findings with clinical histories as given by the surgeon. Even though the appendix be chronically inflamed, pain symptoms may be due to conditions engendered by the focal infection, such as duodenal ulcer or renal calculus, which continues to be progressively troublesome long after the appendix has become quiescent.

In this relation the communication of Barclay and McWilliams (*New York State Journal of Medicine*, February, 1921) is of interest. They report upon two hundred operations for chronic appendicitis in the Presbyterian Hospital in New York, and with a gratifying degree of honesty as to results obtained. They note that 75 per cent were cured; that 11 per cent were

bettered; and some 13 odd per cent were not cured. Of the 49 cases in which there was failure to cure, the appendages of all but three were pathological. In none of the cases had there followed hernia. In half the 200 cases pain was the only symptom before operation, and 71 per cent in all were cured. In about one-half the cases this pain was associated with stomach symptoms, with 80 per cent of cures. As a rule these patients were constipated.

In a further series of 58 private patients who reported for advice because they were unrelieved of symptoms after appendectomies the cause of failure to relieve was incident to the fact that the pain was due to gastric crises in 2; splanchnoptosis in 43; ureteral calculus in 1; pericolic adhesions in 2; duodenal ulcer in 5; in 4 to gall-bladder disease; and in 1 to chronic duodenal obstruction. These 58 private patients were taken from about 700 gastrointestinal patients who reported for treatment because of lack of relief after previous appendectomies. They show that more thorough study before operation would have spared these patients unavailing operations.

On comparing the two summaries it would seem that the hospital patients were more carefully worked up before operation than private ones. There were no subsequent operations necessary among the hospital patients, nor stomach nor duodenal ulcers, or gall-bladder diseases. Colitic and enteroptotic cases in general were not operated upon.

Dr. Gibson's published after-results showed 30 per cent of unsatisfactory cases, with a steady betterment in recent times which he attributed to more thorough explorations and a better preparation of the skin for operation.

As to splanchnoptosis, common enough among neurasthenic women, often characterized by pain and tenderness in the right lower abdominal segment as its dominant feature, the authors believe that the only benefit accruing from removing the appendix is that incident to rest in bed. They place large dependence for the relief of this condition on abdominal support. They

believe that neither Lane's kink nor Jackson's membrane has great pathological significance. They believe that setting-up exercises will do more general good to womankind than any other one thing. The lack of muscular power among the upper classes is appalling, and with this goes a slackening of all the supports.

A routine examination of the stools should exclude colitis as a cause of pain. As for cecal dilatations, when found at the time of operation the cecum should be plicated.

Cabot notes that out of 157 cases of renal and ureteral calculi 10 had been previously operated upon for chronic appendicitis. Radiographs are not always to be trusted, and they were negative in 6 per cent of 127 cases. Braasch reports that one-third of his cases of kidney stone had had previous laparotomies for the relief of pain. The relation between chronic appendicitis and

duodenal ulcer and cholecystitis is so close that at the time of the removal of the appendix examination should be made for the presence or absence of these conditions. The reverse is also true—*i.e.*, the appendix should be removed in operations required for the stomach, and in all pelvic operations it should also be taken away. Chronic duodenal obstruction, due either to adhesions at the jejunoduodenal junction or to compression of the duodenum by the overlying vessels dependent upon intestinal ptosis, may give rise to symptoms suggesting an appendix removal and of course unrelieved by this operation.

The authors propose for this condition an anastomosis between the jejunum and the second portion of the duodenum proximal to the mesenteric vessels. The condition is easily demonstrated after a bismuth meal, and measures for its relief are clear and certain.

Progress in Therapeutics

Medical Therapeutics

A Note on the Use of Antigonococcal Serum.

In the *British Medical Journal* of January 15, 1921, IVENS states that the prevalence of gonorrhea in young and otherwise healthy married women makes it peculiarly necessary not only to improve technique but to utilize all available means to make conservative gynecological surgery a success in the presence of this infection. Until the last few years antigonococcal serum therapy has not been generally employed, although as early as 1895 de Christmas experimented with it in guinea-pigs and rabbits. Wassermann and Wertheim confirmed his experiments, the former showing that the poison was contained in the body of the microbe, which did not belong

to a diffusible group. These results were applied by Rogers and Tory in 1906, and Parke, Davis & Co.'s antigonococcal serum was used successfully in the treatment of gonococcal rheumatism. Recently Paraf alluded to the points of resemblance between the meningococcus and the gonococcus, and urged the necessity for methods of local application of the serum to bring it into immediate contact with the microbe, as is done in the treatment of cerebrospinal meningitis by intrathecal injections. Paraf supported his views by inoculation experiments in the anterior chambers of rabbits' eyes, and by intrathecal injections into monkeys. With Nicolle's serum he cured 14 out of 16 cases of arthritis by the intra-articular injection of serum. This serum is active, possessing agglutinating,

bacteriolytic and bactericidal qualities, and is endowed with therapeutic properties against different strains of gonococci.

Encouraged by the results obtained during the war by the use of specific serums in wound infection, and more especially in gas gangrene, he determined a year ago to experiment with antigonococcal serum in the treatment of some of the cases of gonococcal infection coming under his care. He employed serum in about 30 cases, in 22 of which tubal infection was the most marked feature. Endocervicitis was present in three, and in three cases of arthritis one had occurred during pregnancy, another in the puerperium.

He adopted three methods of application. In one series he gave the serum subcutaneously diluted in normal saline, usually in a dose of 20 Cc., repeated at intervals of a couple of days, every three days, or occasionally a week, giving in all from 20 to 200 Cc.

In another series, on the supposition that the toxin is not diffusible, he tried the intraperitoneal method. Where there were dripping pus tubes or a pyosalpinx the tube was washed out with normal saline, after being, if necessary, opened up. Conservative surgery was adopted when possible, both tubes, or at any rate one, being left. With a syringe 20 Cc. of serum was injected into the tubes, sometimes into the ovary, and the residue left in the pouch of Douglas. The abdomen was then closed without drainage, and the Fowler position adopted. To avert anaphylactic shock a subcutaneous or rectal saline was given simultaneously. This method, which was employed empirically during the war, has been shown by Richet to have a scientific basis—namely, that sodium chloride has a protecting action against the assaulting infection. Lumière and Chevrotier have recently shown that other sodium salts act as well.

Thirdly, in a few cases of endocervicitis with profuse leucorrhea he tried serum packs in the vagina, alternating daily with packs moistened with equal parts of 10-per-cent salt solution and 5-per-cent car-

bolic acid. In one case 200 Cc. of serum were used, but his limited supply did not permit him to utilize this method as frequently as he wished. The after-history of these local cases has been peculiarly good—one has recently become pregnant; another, which had had previous ineffective treatment extending over a couple of years, got quite well, all trace of gonococci disappearing.

In no case has he used serum intravenously, as it is the only method in which he has seen fatal anaphylactic shock supervene after the use of serum. With repeated doses there is little doubt that it is safest to use the fractional method, and not to allow more than seven or eight days to intervene between the first and second doses.

With two exceptions all these patients were married women. Thirteen had no children, and nine only one—a striking percentage of sterility. All but three were between twenty and thirty years of age.

Every effort was made to confirm the diagnosis by bacteriological findings. The history and physical signs were generally clear, and he has not included doubtful cases. The existence of purulent vaginitis and of ophthalmia neonatorum in the children was of diagnostic value. Of the 30 cases subcutaneous injections were used in 19, in 6 intratubal and peritoneal, in 3 vaginal packs, and in 2 cases of Bartholinitis, serum dressings.

All his cases made a good immediate recovery. In nearly all, either by personal investigation or through their medical advisers, he has made himself acquainted with their after-histories, which have been on the whole extremely satisfactory. There have been three definite failures—one an acute case, in which an insufficient quantity of serum was perhaps responsible, and two which relapsed after a period of some months' good health, and in which there was every possibility of reinfection. Further operation had to be undertaken in all three cases; otherwise the results have been good. In spite of their dislike of subcutaneous injections many of the women have said

they were glad to have them, as they felt the benefit. In nearly every case relief of pain was a marked feature. Seen after varying intervals of months the patients described themselves as feeling splendid, being fit for anything, and able to do their own washing—in fact, they form a marked contrast to many other cases of gonorrheal infection in which no serum had been given at operation, and in which the presence of peritoneal adhesions causes so much pain and disability. In one case pregnancy was apparently proceeding normally. Discharges had stopped, and it was difficult to collect enough for bacteriological examinations, all of which were negative.

The Alkali Reserve in Abdominal Infection.

In the *Journal of the American Medical Association* of January 29, 1921, WILLIS states it would seem that there is no indication for the use of sodium bicarbonate in patients suffering from peritoneal infection, if one is permitted to draw conclusions from this small number of experimental and clinical observations. Certainly, there is no justification for the routine use of alkaline therapy, and it should be limited to those cases in which appropriate tests have demonstrated a reduction in the reserve alkali to a point at which it may cause harm. Even here the results to be obtained are problematical.

Acid-base Equilibrium in Disease from the Point of View of Blood Gases.

In the *Journal of Experimental Medicine* for February, 1921, MEANS, BOCK and WOODWELL state that carbon dioxide diagrams (Haggard and Henderson) have been constructed for the blood of a series of hospital patients as a method of studying disturbances in their acid-base equilibrium.

A diabetic with a low level of blood alkali, but with a normal blood reaction—a compensated acidosis, in other words—showed a rapid return toward normal with

no treatment but fasting and increased water and salt intake.

A nephritic with a decompensated acidosis and a very low blood alkali was rapidly brought to a condition of decompensated alkalosis with a high blood alkali by the therapeutic administration of sodium bicarbonate.

It is suggested that the therapeutic use of alkali in acidosis is probably only indicated in the decompensated variety, and that there it should be controlled carefully and the production of alkalosis avoided.

The diagram obtained in three pneumonia patients suggested that they were suffering from a condition of carbonic acidosis, due perhaps to insufficient pulmonary ventilation.

In two out of three cases of anemia the dissociation curve was found to lie at a higher level than normal. No explanation for this finding was offered.

Blood-pressure During Intravenous Injection of Quinine in the Treatment of Malarial Fever.

In the *Indian Medical Gazette* for December, 1920, BRAHMACHARI in his conclusions states:

1. Intravenous injection of quinine in concentrated solution (10 grains in 20 Cc.) is generally followed by a fall in blood-pressure and sometimes by a disappearance of the pulse for a few seconds.

2. Intravenous injection of quinine in dilute solution (10 grains in 200 Cc.) may be followed by a fall in blood-pressure, but it is neither so sudden nor so great as in the case of concentrated solutions. In many cases there is no fall of blood-pressure.

3. The slower the injection is given, the less is the chance of fall of blood-pressure taking place.

4. The diminished blood-pressure after intravenous injection of quinine may persist for twelve hours or more after the injection.

5. Intravenous injection of quinine should always be given in very dilute form (1 in 300). The injection must be given at the

rate of 10 Cc. every minute. It should never be lightly undertaken.

6. Intravenous injection of quinine in concentrated solution may be followed by transient muscular twitchings and quickness of breathing.

7. Intravenous injection of quinine should be given, making frequent careful blood-pressure observations during the operation.

8. As in malarial fever, especially of the pernicious type, the blood-pressure is sometimes very low; intravenous injection of quinine should be given very slowly in a dilute form, guarded by administration of pituitrin or adrenalin and the application of tight bandages over the extremities.

If we take the above precautions, the dangers of intravenous injection of quinine will be reduced to a minimum.

Blackwater Fever.

The *British Medical Journal* of January 15, 1921, in an editorial on this subject states that Dudgeon's study of 100 cases of blackwater fever in the Balkans during the years 1916-18 is rich in the observations of an experienced pathologist, and contains interesting criticism of the hypotheses suggested for the solution of the vexed question of its pathology. Turning first to the aspects of clinical pathology: jaundice was present in 20 out of the 49 cases with full notes; some of the remaining cases had a yellowish discoloration of the conjunctiva, like that seen in pernicious anemia, but examination of the blood plasma or serum did not show the presence of bile pigment. Emphasis is therefore laid on the importance of checking clinical impressions by laboratory tests, and a method consisting of evaporation of the blood to a dry sticky residue and then applying Gmelin's fuming nitric acid test for bile pigment is described. Numerous observations proved that the red blood-corpuscles are not unduly fragile, and that the blood does not contain auto- or iso-hemolysins; on the other hand, an active hemolytic substance or substances can be extracted by alcohol or acetone from the tissues of fatal cases,

and to a less extent from the urine, but cannot be obtained from the tissues in other conditions, including malaria. These extracts hemolyze human and animal red cells, but the urine from cases of blackwater fever does not hemolyze the red cells of man or sheep, and its injection into rabbits did not produce any bad effects.

In connection with these observations reference is appropriately made to Balfour's ingenious suggestion that blackwater fever may be due to the action of a hemolysin—introduced by a biting insect—on red blood-corpuscles already enfeebled in some way, usually by malaria, but sometimes by tick fever. A malarial history was forthcoming in all the 100 cases, and it is shown that blackwater fever is at its height at the period of the year when the death-rate from malaria is lowest. Film preparations of the blood during the paroxysm of blackwater fever were made in 40 of the 100 cases, and in 42 per cent of these there were malarial parasites present, 60 per cent of these being malignant rings or crescents. Spirochaetes were never detected in the blood or urine; and the experience with the Wassermann reaction and microscopic examination of the tissues after death did not lend any support to the view that syphilis, which is casually related to paroxysmal hemoglobinuria, plays any part in the etiology of blackwater fever.

The well-known hypothesis that quinine poisoning explains the disease was investigated in several ways, but neither consideration of the clinical history in the cases specially analyzed from this point of view nor some animal experiments provided any evidence in its favor. Thus, rabbits rendered intensely anemic by the intravenous injection of immune antisera did not show hemoglobinemia or hemoglobinuria when treated with various preparations of quinine intravenously or intramuscularly; and complete ligature of the ureters in rabbits while quinine was being given or had been given did not induce a condition in any way resembling blackwater fever.

As long ago as 1909 Cleland suggested that blackwater fever was the evidence of

anaphylaxis to the dead protein of the malarial parasite, and since then this idea has attracted some attention; but from a comparison of the morbid changes in black-water fever with those in two fatal cases of anaphylaxis, Professor Dudgeon concludes that the only phenomenon common to both is the hemorrhagic state, which, of course, may be due to various causes.

Amebic Dysentery in Siam.

In the *Journal of the American Medical Association* of January 29, 1921, MENDELSON states that, in his opinion, dysentery that does not respond to emetine in one form or another will not be cured by any other treatment. It is true that symptoms may be temporarily relieved by other methods; but as a rule the result is only temporary and disappointing. Every new treatment that is suggested gets a trial at the hospital, only to end in being supplanted by the hypodermic injection of emetine. He has never used a single irrigation in the bed patients in the Central Hospital.

In private cases, when the patient can afford it, he thinks the best method is to give a hypodermic injection of emetine, one-half grain, once a day, and one grain of emetine-bismuth-iodide by mouth three times a day.

The symptomatic and dietary treatments are, of course, added.

Case of Intolerance to Aspirin.

In the *Indian Medical Gazette* for December, 1920, CLYNE states that he was called in to see a case, a robust tea-planter of forty-one, who was suffering from slight headache and who took one 5-grain tablet of "Empirin," a substitute for aspirin, at 2:30 P.M. on October 3, and went to bed. At 4:30 P.M. he got up, complaining of tightness in the neck and swelling of the face. He was seen at 5 P.M., when there was marked edema of the face, neck, eyelids, lobes of ears, and lips. His eyes were closed owing to the extent of edema of the eyelids. There was an urticarial rash all

over the body, but more on face and upper extremities, and he noticed maculæ around neck and chest. The patient complained of a feeling of suffocation, but this wore off. The whole condition looked most alarming. He was ordered rest, and given a saline purge. Next morning the patient got up, and complained of giddiness; the edema was subsiding, and the rash had almost gone. Recovery was complete in three days. During this attack there was no suppression of urine, and his pulse was 78; the temperature was 98°, and he never complained of feverishness. The patient related that previously after 10 grains of aspirin he had seen a rash, and complained to another doctor that aspirin did not suit him. This is a case of marked idiosyncrasy.

Treatment of Gastric and Duodenal Ulcer.

* The *Lancet* of January 22, 1921, presents the discussion on this subject which took place before the Royal Glasgow Medico-Chirurgical Society. Stockman, representing the physicians' view, commented upon the unsatisfactory state of our knowledge regarding the etiology of these ulcers.

Gastric ulcer, he said, is common in anemic young women; duodenal ulcer frequently occurs in men in the prime of life, and apparently in perfect health. We do not know whether they are primary or secondary lesions following upon unrecognized deeper-lying causes. So far the etiology of the recent clean-cut simple gastric or duodenal ulcer has not been adequately or definitely explained by any of the speculations put forward. It is certain that many people have acute ulcers of stomach and duodenum without any definite symptoms, the ulcers healing of themselves and probably never giving rise to further trouble. Should pain, indigestion, or hemorrhage betray the presence of an ulcer, clinical experience has put in our hands fairly efficient methods of allaying these symptoms and presumably of inducing healing. Absolute rest in bed, light, easily-digested food, attention to the bowels, and

the administration of bismuth and earthy carbonates, seem in most cases to cause healing in from three to five weeks. Lennhartz's dietetic treatment, he thought, on the whole was successful, although treatment was generally stopped too soon. In this way it should be possible to prevent the ulcer from becoming chronic.

Regarding systematic drug treatment designed to produce sound healing, physicians have shown a great want of enterprise. Many patients with gastric and duodenal ulcers keep well for long periods, relapsing under worry, business and domestic strain, or exposure to cold. Anemia should be carefully attended to. It is, however, the chronic ulcer which gives us trouble in practice. Many of its victims are never free from symptoms, and their working capacity is greatly lowered. While medical treatment has shown lack of initiative, surgery has claimed much. Operation for perforation, pyloric stenosis, deformities, obstruction by adhesions, invasion of the pancreas, liver, and gall-bladder shows brilliant results, but by no means invariably; severe hemorrhage seldom comes into this category. Gastroenterostomy for the cure of uncomplicated chronic or recurrent ulceration does not stand on a secure basis, and possibly should not be done at all. Strict rest and diet after the operation do good, but recurrence occurs very much as in unoperated cases, and regurgitation of bile is a dreadful sequel to the operation. Moynihan has abandoned gastroenterostomy in favor of gastrectomy. Mayo advises gastroenterostomy and burning out of the ulcer. But why operate at all? Perforation is a rare occurrence and can be dealt with efficiently by operation if it does occur. It is claimed that excision of the ulcer prevents the after-development of cancer, but if ulceration is the determining cause, cancer should be equally common in the duodenum, which it is not.

Nicoll, representing the surgeons' view, said it is impossible to divorce the discussion of treatment from that of etiology. Gastric and duodenal ulcers differ in two

particulars: gastric ulcer tends to become malignant, duodenal ulcer hardly ever. Gastric ulcer is common in young females, duodenal affects middle-aged men. Pancreatitis, along with gastric and duodenal ulcers, is steadily following appendicitis, intestinal obstruction, and cholelithiasis in becoming the object of immediate surgical treatment. The last word in diagnosis lies with the surgeon. For duodenal ulcer, enfolding with closure of the pylorus is the proper course. This necessarily involves gastroenterostomy. For gastric ulcer, excision or enfolding constitute the treatment; the superaddition of gastroenterostomy then depends upon the site of the ulcer and the degree of distortion of stomach produced by the excision or enfolding. Concerning points of detail Nicoll said:

(a) Large parietal incisions should be employed so that the other organs in the abdomen may be examined.

(b) Gastric and duodenal ulcers apparently cured by medical means not infrequently relapse, perforate, bleed, or become malignant.

(c) Microscopic examination of all excised gastric ulcers is advisable.

(d) When gastroenterostomy is called for alone or in addition to pyloric closure or excision of the ulcer, in most cases the ordinary posterior operation answers well. Should this lead to bile regurgitation three methods are available: gastroenterostomy plus enteroenterostomy; Roux's gastroenterostomy "en Y"; or a modification of that permitting of side-to-side union. Nicoll prefers the third method.

Adamson presented the case from the point of view of the practitioner. Hurst has recently said that if practitioners and physicians only do their duty, cases of ulcer will never reach the stage in which the surgeon's help is required, from which it is clear that Hurst has never engaged in general practice. Sooner or later the majority of cases yield to medical treatment when diet restriction and other treatment are relaxed. Many are cured because treated in their earliest stages. In the

presence of proved ulceration the cure is often only partial, as the ulcer is not completely and soundly healed. Once the symptoms have disappeared patients return to unhealthy surroundings, to food wrong in quantity and quality, naturally with a return of their trouble, which is then more difficult to heal. What is required is prolonged after-treatment in the early cases, for frequent recurrence is apt to be followed by deformities of the stomach, pylorus, and duodenum, which might be worse than the primary disease. Adamson then considered in more detail how the cases presented themselves to the practitioner.

1. The type that is brought to our notice first by perforation. In these cases few, if any, symptoms have preceded the perforation, and in these cases the medical treatment only begins when the surgical treatment ceases. In young subjects the prognosis appears to be good.

2. The type that begins with hematemesis, sometimes a pinhole perforation of a blood-vessel. Here also there is often little or no history of previous indigestion. The early recognition of the serious nature of the illness with the consequent prolonged and thorough treatment usually leads to recovery, which is generally enduring.

3. The large group of cases labeled indigestion, dyspepsia, gastric catarrh, gastritis, or bilious attacks. These cases yield, for the time at least, to rest in bed, rectal salines, or other less drastic measures. In most recovery is temporary, and there is recurrence months or even years after. Many come to the surgeon for perforation or pyloric stenosis, and the results of surgical treatment are highly satisfactory.

4. Duodenal ulceration. This may appear as a simple hyperchlorhydric indigestion which comes and goes, often in the spring and autumn. In definite ulceration our medical treatment meets with success up to a point and chronicity is often established, and then hemorrhage and perforation are likely enough to occur.

He asked: What is wrong with our treatment? The methods are probably not at

fault, but after-treatment is not sufficiently prolonged. It should be continued for years, the question of suitable diet being all-important.

Cowan said that the mortality of ulcer was considerable. In a series of 120 patients who were in his wards suffering from some form of ulceration of the stomach or duodenum, 15 died—i.e., 12.5 per cent; 8 died from hemorrhage, 4 from perforation, 1 from toxemia, 1 from exhaustion, and 1 from an unknown cause a few days after refusing operation. He had recommended operation in 21 patients (17.5 per cent), and in two others operation had been required within a short period of their discharge from hospital. Operation had been performed in 17 cases, seven times on account of recurrent hemorrhage, seven times on account of dilatation of the stomach, thrice for a perforation. Two of these patients died, both from perforative peritonitis. The ulcer was situated in the duodenum in 10 cases and in the stomach in 6. In the other patient no ulceration could be discovered at the operation. In another patient, who died from hemorrhage, a small erosion proved the source of the bleeding. Operation was indicated in all cases with pyloric obstruction and in those with peritonitis.

The after-results of operation are still undetermined; only five have answered his inquiries, all being well three to eleven years later. The best results were obtained by close coöperation between physician and surgeon and careful examination by every possible means of the particular features of each individual group. In his series the mortality in the operation group was 11.7 per cent, and in the non-operation group 12.6 per cent.

McKendrick suggested that operation should be limited to gastric and duodenal ulcers attended with severe recurrent hemorrhage, pyloric stenosis, gastric tetany, or perforation, or where evidence is present of a localized peritonitis or subphrenic abscess. X-rays afford a reliable guide when the results are carefully interpreted. When the stomach empties in five to six

hours prolonged medical treatment should be applied to patients resting in bed. Should pyloric stenosis follow operation can be resorted to. The mere presence of occult blood in the feces is not sufficient reason for operation.

Dalziel agreed that a large proportion of gastric ulcers require operation, but acute ulcers do not call for intervention until prolonged treatment has first been tried. In America the feeling is in favor of gastrectomy. How many physicians or pathologists have seen a healed chronic ulcer? Gemmell has said that a chronic ulcer never heals. The results of gastroenterostomy are better than they have been, and he has been struck by the good results of extirpation. Syphilis he does not consider a common cause of ulcer.

Hunter, the chairman, referred to the question of a syphilitic ulceration of the stomach. In one case specific treatment was followed by cure, demonstrated by x-ray examination. He also quoted several other cases treated in diverse ways.

Clark said that our unsatisfactory knowledge of the etiology of gastric and duodenal ulcers at present precludes much advance in their treatment. Until the physiological functions and actions of the stomach and duodenum are taken into account treatment is liable to be only symptomatic.

The stomach is a muscular organ fixed more or less at both ends, and roughly divisible into a fundic or receiving and a pyloric or churning part. During digestion the prepyloric sphincter shows as a constriction. The fundic stomach supplies the pyloric stomach with food and acid juice, which the pyloric stomach churns up and propels against the pylorus, whence it passes on as acid chyme when the chemical and nervous stimulus opens the valve. The natural direction will continue so long as the pylorus is freely patent; and when, from stenosis, it becomes less so, the musculature of the pyloric stomach hypertrophies to meet the new conditions, just as does cardiac muscle. When the stenosis is very great and delay in emptying becomes extreme, the effect of gravity, distention

with food and gas, etc., causes great stretching, and as a result the peristalsis loses its force and direction—possibly like an auricle or ventricle in fibrillation. In other words, compensation has broken down. Clark said that it was not difficult, then, to see why operative interference by gastroenterostomy very often fails when there is no marked stenosis and consequent delay and dilatation; the emptying of food and acid juice mixture—not properly triturated chyme—occurs far too rapidly, and intestinal and other troubles follow. He said that after cutting or cauterizing raw injured surfaces are exposed to the gastric juice and the claim that operation removed the source of irritation cannot be sound. He considered that the gnawing pain is due largely to muscular action, probably antiperistaltic action to return food unsuitable to the mucous membrane and digestive juices of the stomach concerned. The operation of ligating the pylorus, providing this is fairly patent, could only result in desperate efforts of the pylorus to open when the chemical and nervous stimuli reach their normal reacting point, added to by the forcible pyloric stomach peristalsis behind. No wonder there is gnawing pain. In the presence of marked stenosis, delay, and dilatation, with broken-down compensation, the performance of gastroenterostomy is almost always brilliantly successful. In its absence failure is far too frequent to encourage its recommendation. If the patient takes the same care in the way of rest, diet, etc., without operation as after operation, his relief will generally far outdistance any benefit he would obtain from surgical interference. Severe and uncontrollable hemorrhage, like perforation, is a condition in which operation has no alternative.

Jack said that most physicians agree as to the type of case suitable for operation, but that surgeons take a wider view. In his experience where, in acute gastric ulcer with hemorrhage, an operation is performed to ligature the vessel the surgeon invariably fails. In similar conditions medical treatment has repeatedly succeeded. He asked

for late results from surgeons and for statistics. Most methods succeed temporarily, sometimes for years, but he wished to know if surgical relief is greater than medical and more prolonged. We all know of cases in which, after operation, symptoms similar to those occurring previously have persisted. Other cases have substituted an ulcer of the bowel for one of the stomach. He wishes to have statistics of cases showing these results.

Jones said that whereas the physician and the surgeon see the cases often after long duration, the practitioner sees them before, during, and after treatment. We need complete statistics over long periods. Dr. Jones referred at length to the different types of case—of ulcer and of simulated ulcer—seen by the general practitioner, and commented upon the probable effect of the prolonged rest after operation upon the body and mind of the patient. He mentioned many different conditions leading to symptoms simulating gastric ulcer, and outlined the types of treatment he found most suitable in each case.

McLennan was convinced that in every case all available measures of investigation into the condition should be applied. X-rays as well as chemical methods are necessary. Where the stomach is ptosed without pyloric stenosis surgical interference is not indicated, although if an ulcer exists the sufferer is in a most unhappy condition. So also is the patient who after operation suffers from regurgitation of bile with vomiting and distention. He said that the digital stretching of the pylorus for dilatation of the stomach has proved satisfactory. On the question as to whether immediate gastroenterostomy should follow laparotomy for perforation, McLennan said that in the hands of his colleague, Campbell, who does not usually perform an enterostomy at the time, many cases do very well without further operation. The Mayos say that a perforated duodenal ulcer heals better than an unperforated one for some unknown reason. Duodenal ulcers do not heal so well as gastric ones.

Russell said that he was becoming

increasingly reluctant to advise operation, but believes more in mental and physical rest. Small doses of opium seem to do good. He gave in detail his opinion of the suitability of various foods at various stages of convalescence.

Young remarked that only by combining purely medical and purely surgical views could one arrive at a useful conclusion. He agreed with previous speakers that the aids to diagnosis available are often real and reliable. The surgeon has to deal mainly with the chronic ulcer. A proportion of acute cases with perforation or alarming bleeding occurs, but a majority are chronic.

The question therefore arises whether it could be true that a chronic ulcer never heals. Why should it not heal? The suggestion that all symptoms could disappear, perhaps permanently, and the ulcer still remain appears to Young inconsistent with the facts of pathology and with the symptoms of disease. Few surgeons have escaped seeing evidence at operations of healed gastric and duodenal ulcers. Young asked why it was that symptoms of gastric and duodenal ulcers so often vanish in a single night, after days and weeks of almost constant distress. He then proceeded to analyze Nicoll's thesis that such ulcers should always be treated surgically on the ground that treated medically they frequently may relapse. He suggested that Nicoll's description of the second remedial operations for the correction of the unfortunate after-effects of the first ones show that even the surgeon has no reliable panacea for these conditions. Nicoll has said that he is fast coming to the position that all cases of gastric ulcer should be treated by partial gastrectomy or excision of the ulcer. Young pointed out that of all those entering into the discussion that evening more than half had been at one time or another victims of the condition, and many of the rest also. Are those persons prepared to accept the position that gastrectomy is the only possible treatment? They are not. His own experience has convinced him that a posterior (no loop) gastrojejunostomy, without ligature or

closure of the pylorus, is treatment that will give good results in a large proportion of cases. Since the last meeting he has made an inquiry into the subsequent progress of all his private and hospital cases of gastric and duodenal ulcers. So far the results have been more satisfactory than could have been hoped for. Young concluded by reading two sample replies. He promised to submit to the society later a digest of the complete figures obtained.

Nicoll, in reply, thought the discussion would do good. He would have preferred the consideration of gastric ulcer separately from duodenal ulcer. "Gastric ulcer" is passing to the position the "appendix" held some time ago. Gastric ulcers tend to become malignant and should be excised. Help is needed from physicians, pathologists, and physiologists in the treatment of gastric and duodenal ulcer.

The Treatment of Colds.

The *American Journal of Electrotherapeutics and Radiology* for January, 1921, in an editorial on this subject states that it is not generally understood what can be accomplished by the use of radiant light and heat and the high-frequency current in the treatment of colds, including thoracic cases.

Treatment of colds in the head and larynx by the small radiant light apparatus has been recognized for a long time by many physicians. The application of radiant light and heat over the face and throat applied for one hour once or twice daily so promptly relieves coryza and laryngitis that this method should be in general use by laymen, and advised by the profession in general. It has been shown and demonstrated that the application of radiant light and heat with large applicators, or for longer periods of time with the smaller applicators, is remarkably effective in the relief of cases of pleurisy and bronchitis, and some physicians have justly added pneumonia to the list benefited by this treatment.

A method fraught with no danger and promising so much is worthy of the trial,

and its adoption and recognition will eventually follow its employment in families where electric light is installed, and in hospitals generally.

Better than radiant light and heat in treating pulmonary and throat cases is the employment of diathermy with two large electrodes in the former and smaller ones in the latter cases, placed anteriorly and posteriorly and employed with prolonged daily administrations—from three-fourths of an hour to one hour.

In connection with the use of diathermy, in all conditions complicated by infection, the x -ray seems to act as a congener; so in the treatment of cases of severe, acute, and chronic pleurisy and bronchitis it adds much to the relief of the condition when employed in conjunction with the high-frequency current. Two applications of 30 milliampere minutes at 15 inches will usually suffice.

When it is realized that a cold originates from exposure with lowered resistance of the parts attacked, the rationale of these treatments will be readily appreciated; for by raising the local resistance by inducing increased circulation—hyperemia—by administration of heat, the local tissue resistance will be so raised that there will be a restoration of a normal condition with destruction of the germs present.

At this season of the year there are probably no other measures in medicine which will prove so acceptable as these in the treatment of colds.

Treatment of Nervous Insomnia.

In the *Lancet* of January 22, 1921, ZANGER states that the disturbances of the circulation play an important part in the causation of insomnia; that form of the condition which is associated with myocarditis and heart failure yields not so much to sedatives as to cardiotonics. In the arteriosclerosis with reduced blood-pressure he has found spirit of camphor gives good results and also controls the accompanying insomnia. Again, in arteriosclerosis with increased blood-pressure, if

the kidneys are not diseased, small doses of nitroglycerin given for weeks and months keep the blood-pressure almost normal and also relieve the insomnia. Excess of hydrochloric acid often causes irritation of the nerves of the stomach, eructations, and flatulence, which contribute to sleeplessness; here an alkaline and dietetic treatment is of use, and he finds tablets of alcohol, a colloid hydroxide of alumen, slowly dissolved in the mouth, cure the insomnia.

His own treatment of nervous insomnia, which is often the principal and most distressing symptom of an underlying neurosis, consists of a combination of medicinal and psychic treatment.

For from four to eight days he prescribes 8 grs. of barbital or the soluble sodium barbital, or $1\frac{1}{2}$ grs. of dial-ciba, to secure from the very first three to six hours of sleep every night, thereby quieting the patient and giving him confidence. Afterward he gives two tablespoonfuls (30 g.) of a solution of sodium bromide (1 in 20) just before supper, and for a week half-doses of barbital or dial. As improvement continues the latter are reduced to half-doses every other day for a week, and are then completely discontinued. At the end of a month the bromide can also generally be gradually reduced to three-quarters or even half the amount. Of course these doses must be individually modified in each case. The whole bromide treatment lasts from one to three months, according to the severity of the case; its action is not only sedative, but successfully combats the mental depression always present during nervous insomnia. As a tonic after the bromide treatment lecithin injections are often of great value.

First of all the physician must investigate the patient's mind in order to discover and discuss psychic states which may have originated the nervous disturbances. The patient should learn to confide completely in the physician; the latter must not attempt to bring the patient under the ban of his mental force and power of will, as do hypnotists and the modern school of ~~what~~ may be described as "sexual therapeu-

tists," but to reëducate the patient's mind and will. The physician must also get into private contact with the patient's family or nearest friends to complete his knowledge of the case and to instruct the relatives as to treatment. Near relatives are, however, often most unsuitable companions and advisers, coming, as they may, from a neurotic stock; it may be desirable to remove the patient from harmful home influences for a period of weeks or months, or even permanently to employ a specially trained nurse or companion, or to make use of a medical home.

In over a hundred cases of psychoneurosis with insomnia that he has treated in the last five years, the results have been satisfactory. He has not found it necessary or desirable to refer at length to sexual matters in more than half a score of cases, and then thoroughly and earnestly. He is greatly averse to the modern system of daily investigation of the sexual life. As Veraguth said after a lecture on psychic treatment by the Freudian system, given some fifteen years ago by Jung, of Küsnacht, to the Society of Medical Practitioners of Zurich: "For one complex you eliminate, you produce ten new ones."

Acute Endocarditis in Children.

In the *American Journal of Diseases of Children* for February, 1921, LEDFORD states that the treatment in cases of acute endocarditis in children consists largely of rest in bed. Everything else is to be considered subordinate. The patients are kept as nearly flat in bed as possible, judgment being used in this connection, however, because being kept flat may cause so much fretting and fussing that more strain will be brought on the heart than if the patient is allowed to sit up in bed and play with toys. The severely ill patients are not to be allowed to feed themselves, but are to be fed in order to prevent even that slight exertion. If there is severe dyspnea or orthopnea they are propped up with pillows so that they may assume the most comfortable position. There is not a set period of

time for all patients to remain in bed, this being determined in each individual case by the duration of the symptoms and the reaction of the heart to exercise. When the temperature has become normal and the cardiac symptoms show that the acute infection has subsided, the strict rest treatment is very gradually relaxed, the patient being observed closely.

When the acute symptoms have definitely and permanently subsided the patients are discharged from the hospital. The patients in the hospital with which he is connected and in whom the symptoms are slightly active, are sent to institutions especially provided for their care. The patients with inactive lesions are discharged home to be followed up by the social service, and seen at frequent intervals at the out-patient department of the hospital.

For two or three months the patients are to be given a limited amount of exercise, being kept in bed the greater part of the time. During the next one or two years the amount of exercise is to be limited, and finally an effort is made to plan the whole life so as to save the heart.

The nutrition and physical condition are to be kept in the best possible state, because the nutrition of the heart muscle depends to a considerable extent on the general nutrition.

Of his 250 ward cases, the patients of the mild group were kept in bed in the hospital an average of 30.5 days, and those in the severe group an average of 50 days.

The general measures of treatment employed in the hospital were those for acute infectious diseases in general. The bowels were kept open, and the diet consisted at first of milk and starchy foods; later meat and eggs were allowed. In cases occurring with acute rheumatic fever, acetyl salicylic acid was given freely. Digitalis was used very infrequently, being given only in the cases of chronic valvular lesions with failure of compensation. It was not given in cases of simple acute endocarditis. Sedatives were used when demanded. When the heart was irritable and the action rapid, and especially if there was precordial pain, an

ice-bag was applied over the heart. Other symptoms were treated as they arose.

When the focus of the infection could be located, it was, as a rule, removed before the patient was discharged from the hospital. It was difficult sometimes to determine just when the focus should be removed. If the acute symptoms gradually cleared up with the focus present, it was not removed until the acute symptoms had subsided. If it was thought, however, that the local focus was keeping the acute symptoms active over an extended period of time, and the condition of the patient was not too bad, the focus was removed. The teeth and tonsils were the most frequent local foci of infection. Ether anesthesia was administered without hesitation for tonsillectomies and for teeth extraction, when necessary. No bad results occurred so far as the heart was concerned.

One hundred and six patients, or 42.4 per cent, were discharged home, without active symptoms, to be supervised and cared for by the social service and the out-patient department of the hospitals. Sixty-seven patients, or 26.8 per cent, were discharged with slightly active symptoms, to institutions provided for this class of cases. Thirty-seven patients, or 14.8 per cent, were discharged against advice with active symptoms. This demonstrates the difficulty in obtaining the coöperation of the parents so necessary in the prolonged treatment of this disease. The remaining forty patients, or 16 per cent, died.

Treatment of Malignant Disease with Special Reference to Radium in Needles.

In the *American Journal of Electrotherapeutics and Radiology* for January, 1921, CLARK states that the adaptation of hollow metallic needles, each containing some radium salt—preferably the sulphate—representing a known quantity of radium element, has revolutionized radium technique. He employs needles containing 5 to 10 milligrammes. These needles are used for

insertion into malignant growths and glands, or into an organ contained in the peritoneal cavity after exposure of the lesion by laparotomy—the pylorus, for example. Results are obtained by this method of radium application that cannot be secured by the application of radium in capsule or plaque. This method of application is more accurate, and a comparatively small quantity of radium applied in needles will produce even more favorable results than a large quantity applied from the outside or inserted in capsule form into the malignant tissue through an incision. Under the latter condition the action is too concentrated at the point of contact and the advantage of cross-firing is not obtained. The capsule and plaque, however, have their special and even indispensable uses when radium must be applied from the outside or in a cavity. The needles are particularly efficacious in the treatment of growths too large for radium penetration from the outside by capsule or plaque, and in the more resistant forms which have been found unresponsive to radium externally applied. As many needles as necessary may be inserted 20 to 25 millimeters apart, to any depth, into the tissues, thus taking advantage of concentric cross-fire radiation from needle to needle. If a sufficient number of needles are available, they may be grouped together and put into a capsule or brass or other metallic filter and covered with rubber. These may be used in the same manner as the ordinary radium capsule; or the needles may be placed side by side in a suitable flat metallic container covered with rubber and used whenever a flat plaque of standard construction is indicated for the treatment of malignant disease.

After experimentation with various metallic elements, including gold-plated steel, platinum, iridoplatinum, Monel metal, stellite, and an alloy of steel and nickel known as "non-corrosive steel," the last named has been adopted as most durable and possessing the proper filtration qualities for the purpose of radium application. These needles have been made to order

in lengths varying from 20 to 30 millimeters. Some are round with tapering points, others have cutting, trocar points; and yet others are compressed until they are slightly flattened, though still maintaining the hollow center, so that they may be inserted, for example, through an endoscope into the larynx between the cartilage and the membrane with a minimum amount of trauma to the tissues. The eye end of the needle is tapering, so that it may be withdrawn easily by means of a braided silk thread after insertion below the surface. The shorter 20-mm. needles are used in delicate structures such as the eyelids, canthi, larynx, etc., and the longer 30-mm. needles in less delicate structures more extensively diseased. The wall thickness is invariably 0.5 mm., as this seems to give the desired filtration. The diameter at the widest point of the author's needles is 2 mm. or 15 gauge, measured by a Stubbs English wire gauge. The hollow needles are so constructed that they are divided about 1 mm. below the eye. After the needles are filled with radium sulphate in the laboratory, the sections are screwed together, welded securely, and polished so that there will be no leakage of radium emanation and no possible focus of corrosion with resultant loss of radium. If the needle wears through at the eye, the upper section may be replaced without discarding the whole needle or jeopardizing the radium.

These radium needles may be inserted directly into soft tissues by means of a special applicator or a small pointed hemostat, and they may be carried beneath the surface of the growth as deeply as desired. A braided silk thread is always attached to the needle so that it may be withdrawn easily from the tissue, and to obviate the possibility of losing the needle with the subsequent necessity of incising to find it. In dense, hard tissue a trocar or narrow blade scalpel is first used to render the insertion of the needle possible without force. Local anesthesia by 2-per-cent novocaine and adrenalin is ordinarily used, although when many needles are inserted at one time

in very sensitive structures a general anesthetic may be employed to advantage.

Proper filtration is all-important with any radium treatment, depending upon whether the beta or gamma rays are to be utilized. The hardest of the gamma rays are very penetrating and exert a more powerful action upon malignant cells than the others, though the softer gamma and the beta rays are utilized especially where destruction of tissue is desired. Time will not permit of a full discussion of the important filtration question, the uses of the different radium rays, and modifications of technique to suit various types of cases. Essential information along this line may be obtained from textbooks and current medical literature dealing with radium therapy.

It is still the opinion of some physicists and radiumologists that radium needles are of little practical utility, since it is thought that the secondary radiations from the metal in contact with the tissues cause great irritation and objectionable sloughs even with short exposures, and that sloughing near vital structures may jeopardize the life of the patient.

Clinical experience has demonstrated the fallacy of this idea, if exposure is not too long. It is true that, when a metal applicator containing radium is applied to the dry skin for a sufficient period of time, a severe burn of the third degree and sloughing of tissue will result; but when radium needles, each containing 5 to 10 milligrams, or even more, of radium element, are inserted into moist tissues such as constitute malignant growths the film of moisture surrounding the needles may perhaps be sufficient to absorb the secondary rays and the destructive beta rays. The needles may remain in place in some tissues as long as twenty-four hours, causing retrogression and disappearance of malignant growths but no destruction by sloughing. Tissues of low vitality, or structures such as the uvula, or soft tissues which are partly broken down or devitalized, will slough unless the radium dosage is accurately estimated; hence the time of exposure must depend upon the

density and vitality of the tissues and the proximity to vital structures, although blood-vessels such as the carotid artery are surprisingly resistant and no damage has ever been noted, even though the needles were close to the artery as long as twenty-four hours. In some cases of very advanced cancer of the cervix the needles have been allowed to remain in place forty-eight hours without great sloughing and with excellent results. Radium needles are applicable in cases of malignancy where tissue is to be conserved for vital or cosmetic reasons, and their great value has been proven in many cases.

Radium needle treatment should be administered in a hospital under strictly sterile conditions and with a trained nurse in attendance. Every case is a rule unto itself, and no absolutely definite guide can be given as to the duration of the application or the amount of radium to be used. Generally speaking, the needles placed in sarcomatous tissue 20 millimeters apart should be withdrawn in twelve hours. In the case of carcinoma the needles placed 25 millimeters apart should be withdrawn in from eighteen to twenty-four hours. The treatment is repeated in six weeks if necessary, although one needle treatment is usually all that is required. The subsequent treatments may be given by capsule from the outside.

Influence of Diet on the Energy Expenditure in Work.

In the *Journal of the Royal Army Medical Corps* for February, 1921, ORR and KINLOCH, in summarizing their article on this subject, state that:

1. The expenditure of energy per unit of work performed is influenced by the nature of the preceding meal.

- (a) Following a high protein meal the increase due to work is greater than in the preceding post-absorptive state.

- (b) Following a high carbohydrate meal the increase due to work is less than in the preceding post-absorptive state.

- (c) Following a high fat meal there

appears to be a summation of extra energy expenditure due to food and that due to work.

2. It is suggested that the difference in the results obtained in these three cases is due to a difference in the mechanisms of stimulation involved in the increase of metabolism following the ingestion of protein and of carbohydrate and fat.

Treatment of Inoperable Uterine Cancer.

The *British Medical Journal* of January 29, 1921, in its Reports of Societies refers to a paper presented by Cole at a meeting of the Section of Obstetrics and Gynecology of the Royal Society of Medicine, held on January 6, which was based on a series of forty-three cases of inoperable uterine carcinoma treated by the cold cautery method of Percy.

Cole states that he felt impelled to make known his experience of this method, as it had been the subject of considerable criticism in America. Owing to this adverse criticism the method had not been supported in England, and although other cautery methods had been employed, he was under the impression that his experience of this particular method was unique. He laid much stress on the value of unvarying assistance.

The technique of the operation could be divided into (1) abdominal—the abdominal cavity being freely opened by subumbilical incision, and the internal iliac arteries, the ovarian vessels, and the round ligaments ligated; (2) vaginal—dilatation of the vagina being first effected by means of a flange and screw dilator, until the insertion of a water-cooled speculum could be made. This speculum had a surrounding water-jacket space, through which water circulated and so protected the vaginal wall from damage by the heated cautery. Redundant growth was removed by a sharp curette, and the cautery then directed through the cervix into the uterine cavity. From this time onward the direction of movements of the cautery were controlled by the assistant,

either by verbal directions or by movements, his hand inside the abdomen grasping the fundus of the uterus. Two degrees of heat had been employed—a high or destructive degree and a low or cooking degree; the degree of heat had to be estimated by the abdominal assistant, and might be considered by him sufficient when the heat transmitted through the tissues to his palpating hand was such as to be just bearable. When fundus and cervix had been treated, outlying areas in the bases of the broad ligaments were dealt with, particular stress being laid upon the care necessary to avoid overheating when dealing with the anterior vaginal wall. Failure in this respect had led to the formation of a vesicovaginal fistula. It was freely admitted that this postoperative complication was most distressing to the patient, and was, in fact, the chief drawback of the procedure.

When the pelvic contents had been efficiently treated the preoperation rigidity had given place to a softness and mobility which were both unexpected and characteristic. Viewed from below the cervix presented a large funnel-shaped crater, the sides of which were quite firm, perfectly dry, and of a peculiar grayish-yellow color. When the cauterization had been completed the abdominal wall was sewn up in three layers by the assistant. In 1914 ligation of vessels was not undertaken by Percy, but the ligation of the iliacs and other vessels to the uterus was carried out by him on account of severe secondary hemorrhage, which the first few cases clearly showed to be a grave danger. Danger to the ureters had been found to be negligible in ligaturing the internal iliacs, a greater risk being that of wounding the iliac vein as it lay behind the artery.

Gauged by any standard of selection, the type of case dealt with in this series of forty-three was inoperable; the cases were recruited from inoperable cases so certified by practitioners, or admitted to the Cancer Hospital from the out-patient department, their condition being verified in every instance by the visiting staff. The almost

constant presence of pyometra, as revealed at operation, was commented on, and the extraordinary immediate improvement in the appearance of the patients could best be accounted for on the assumption that pyometra was the causative factor. The comparative rarity of demonstrable glandular invasion had been remarkable, and it was suggested that this freedom was not only apparent but real, for Leitch, in a series of 915 post-mortem examinations, had found that metastasis of any kind occurred in only 405, or 45 per cent. In other words, 55 per cent of cases which had run their course without surgical intervention had died as the result of effects determined by what had remained to the last a local lesion. Dilatation of the ureters—sometimes to an extreme degree—had been frequently noted; and, again, it was pointed out that Leitch in his series of 915 cases had found the kidneys hydronephrotic and the ureters dilated in 75 per cent.

As regards the progress of these cases, the abdominal wall had healed without suppuration in every case. Temperature and shock had been absent, and an immediate improvement in the patient's appearance had been consistently noted, yet several of the patients were over fifty, and one was aged sixty-eight. A foul discharge might commence on the third or fourth day and exist for a fortnight or so; this was best treated by the administration of a weak iodine douche. Patients had been kept in bed for three weeks, and had left the hospital at the end of a month. Vesicovaginal fistula had resulted in seven cases; in those cases leakage might have diminished somewhat, but healing had never taken place. This most uncomfortable complication was, however, a frequent result of the untreated disease, and it was urged that vesicovaginal fistula with freedom from malignant disease was, at any rate, preferable to a vesicovaginal or rectovaginal fistula with all the accompaniments of progressive and septic cancerous infiltration. Cole expressed no desire to conceal the fact that failures had been frequent, but as the cases dealt with by him could not

conceivably be made worse, any improvement was to the good. He exhibited three cases:

(1) A young woman, aged thirty-five, upon whom operation had been performed nearly three years ago, and examination by members of the Section had failed to reveal the existence now of any demonstrable malignant disease. (2) A woman, aged forty-five, operated on one year ago, was free from discharge and pain since the operation and was now enjoying good health. (3) A woman, now aged seventy-one, operated on three years and three months ago, had a vesicovaginal fistula, and although she found the fistula a source of great discomfort, she was yet quite emphatic that life was worth living; she also was recorded as now being free from demonstrable malignant disease.

It had been found latterly that the following up of these cases by the implantation of radium needles had given good results, and he was of opinion that this conjoint treatment by cautery and radium held out to these patients the best chance of palliation and temporary relief from distressing discharges, together with a chance of a very materially increased term of useful life.

The Treatment of Eclampsia.

In the *Ohio State Medical Journal* for February, 1921, UPDEGRAFF states that R. McPherson, formerly an advocate of active treatment, but later impressed by the good result of the more conservative treatment, notably from the Rotunda Hospital, began about three years ago to employ the medical treatment. His method may be given as an example of the present trend to conservatism. Briefly it is as follows:

Immediately on entrance the patient's blood-pressure is taken, a catheterized specimen of urine secured, and the patient is put in a dark isolation room and as much quiet obtained as possible. She is then given a hypodermic of $\frac{1}{2}$ grain of morphine sulphate; her stomach is washed out,

two ounces of castor oil being poured down the tube at the end of lavage, and a colonic irrigation of five gallons of 5-per-cent glucose solution given. If the blood-pressure is over 175 systolic, phlebotomy is done and sufficient blood is extracted to bring it down to 150. Phlebotomy is not done if the pressure is below 175; and if for any reason much blood is lost during delivery, the pressure may be so low as to endanger the patient's life. The same objection applies to large doses of *veratrum viride antepartum*.

The patient is now kept quiet and $\frac{1}{4}$ grain of morphine given every hour until the respirations drop to eight per minute. At this time convulsions have usually ceased, the patient has fallen into labor and is usually delivered normally, or by an easy low forceps. Occasionally a little ether is necessary while waiting for the action of the morphine. In a series of 67 cases a corrected maternal mortality of 7.4 per cent and a fetal mortality of 28.5 per cent were obtained.

Hydrostatic bags may be used to induce or shorten labor, as well as manual dilatation of a soft, already partially dilated cervix to permit of a medium or low forceps operation.

Dr. Cragin recently presented comparative statistics of ten years' work at the Sloane Maternity which show that the mortality in eclampsia of both mother and child has gone down about 50 per cent because patients were treated conservatively.

For the unskilled practitioner the medical treatment surely offers the best promise of success.

Broadhead emphasizes his belief that probably in a large percentage of cases abdominal section is unjustifiable. When the child is dead or not viable, the patient in active labor with the cervix dilated or easily dilatable, and she cannot have a well-equipped hospital and a competent surgeon, other procedures may not only be more advisable but absolutely indicated.

But nevertheless, in a considerable number of cases, Cæsarian section is probably

the safest, easiest, and most satisfactory treatment. In a primipara with unshortened and undilated cervix, with proper help and surroundings, it would be the advisable treatment, and it must be remembered that eclampsia is about four times more common in primiparæ than in multiparæ. The contraindications are repeated vaginal examinations, more particularly where the bag of waters has been broken; and, of course, where unsuccessful attempts at delivery have been made, and where there is any infective process in the birth canal.

E. P. Davis states that he has long since abandoned abdominal section for toxic patients suffering from convulsions, except when the patient is a vigorous primipara with unshortened and undilated cervix who has had few convulsions and does not respond to eliminative treatment. He feels, however, that there is a distinct field for elective section in the toxemia of pregnancy. When hygienic measures fail in the later months of gestation, toxemia steadily increases, there is no sign of labor, and active treatment of the toxemia fails to check its progress, although the patient does not have any convulsions, prompt delivery by section is indicated.

It is doubtful whether the intensity of the toxemia is an indication for Cæsarian section except in primiparæ with the prospect of a long labor ahead.

Decapsulation of the kidney has been mentioned, but is applicable in only one class of cases in which there is an anuria—it has a good functional result in about 80 per cent of cases.

Lumbar puncture has been done with apparent benefit, probably from reduction of intracranial pressure.

Glyceryl trinitrate must be considered to reduce arterial pressure, and for its diuretic action. The cardiovascular system must be supported by stimulants.

The author concludes:

1. Since pregnancy is responsible for eclampsia, its termination by one method or another is indicated as soon as a convulsion has occurred.
2. Each case must be considered individ-

ually, and that method of delivery adopted which seems safest for that particular case.

3. Difficult forceps operation, forcible dilatation of the cervix, incisions of the cervix, and vaginal Cæsarian section have no place in the modern treatment of eclampsia at term.

4. Multiparæ, in the absence of obstructed labor, with their comparatively short period of prospective labor ahead of them, are good risks for the conservative treatment.

5. Delivery by abdominal section is more particularly indicated in primiparæ with rigid, undilated cervix, living baby, intact bag of waters, and no infective process in the birth canal.

6. Operations through the abdomen are attended with more risk than through the birth canal if done under unfavorable conditions; hence a suitable environment and a capable operator and assistants are necessary.

7. Ether is the only anesthetic to be used for any operation. Chloroform is contra-indicated because of added strain on the heart and because of the similarity of the pathology of chloroform poisoning to that of eclampsia. Nitrous oxide gas is said to increase blood-pressure.

Thyroid Preparations.

In the *Medical Record* of February 12, 1921, STARR in commenting on this subject states that there is no remedy which is more generally useful in conditions of malnutrition, of anemia, of neurasthenia, of general feebleness, or after recovery from serious diseases which impair the vitality, than thyroid. In advancing years, at the menopause, and in old age it is known that the glandular activity diminishes, and experience has convinced him that a small amount of thyroid two or three times a day is of great service. He also believes it acts in a way to protect the system from the inroad of infectious diseases. It is to him very remarkable that his myxedematous patients have so uniformly escaped infec-

tious colds, catarrhal conditions, and the grippe during all these years. This also is true of patients who have exophthalmic goitre.

The Action of Quinine on the Pregnant Uterus in Malaria.

In the *Lancet* of January 29, 1921, ACTON states that the action of quinine in certain concentrations causes contraction of both the longitudinal and circular fibers of the uterus. The effect produced depends on the concentration of quinine present—weak concentrations 1:300,000 have no effect; concentrations of 1:150,000 produce contractions under certain conditions; whilst a concentration of 1:44,000 produces a tonic spasm, which, if sustained, would cause asphyxia of the fetus from constriction of the placental sinuses. This concentration could only be attained if the patient was nearly poisoned by a large dose of quinine. The degree of concentration in the blood varies with the dose taken and on individual susceptibility depending on the rate of absorption. Cinchonism is correlated with the concentration of quinine present in the blood and varies with different individuals, and is more frequently seen with weak and anemic persons. Concentrations of 1:150,000, such as occur with large doses, increase the strength of the intermittent uterine contractions, and if some exciting cause was present—e.g., weak membranes or a patulous or dilated os—the pressure produced by the increased contractions might be sufficient to cause rupture of the membranes or dilatation of the os, and so bring on labor.

His therapeutic recommendations are:

1. The controlling of the fever by quinine or other cinchona alkaloids must be the first objective in the treatment of these cases. We know that high temperatures soon cause death of the fetus, and this factor is sufficient to induce premature labor. The mother's temperature should be carefully watched and prevented from exceeding 103° F. by sponging, etc.

2. The avoidance of large doses of these alkaloids. As soon as the diagnosis of malaria is made, which is an urgent matter in pregnancy, quinine or quinidine should be given at once as the case requires. It is better to divide the doses into $2\frac{1}{2}$ - or 5-grain doses given every two or four hours; 20 grains a day is sufficient, and ample to control any attack of malarial fever.

3. The employment of general methods for the prevention of miscarriage, viz., complete rest in bed and the judicious use of opium in allaying any mental excitement. When the child is dead or the miscarriage inevitable, quinine should be given in ordinary doses and the case treated on general obstetrical lines.

The Theory of Disturbed Reflexes in the Production of Symptoms of Disease.

In the *British Medical Journal* of January 29, 1921, SIR JAMES MACKENZIE states that it has been shown that drugs act by causing a disturbance of reflexes. This way of looking at the action of drugs explains much that is obscure in pharmacology, as the following observation shows:

For a long time it was recognized that digitalis acted in a remarkable manner in some cases of rapid pulse in reducing the rate, while it had no effect in other cases. It was never understood why there should be this difference. He found out about fifteen years ago that in the cases in which it had this slowing effect the heart was regulated by abnormal rhythms—mainly that abnormal rhythm due to the condition now recognized as auricular fibrillation. He has attempted many times to reduce the increased rate of the heart when the rhythm was normal, and invariably failed. He speculated for a long time as to the cause of this difference, but never understood it till the theory of disturbed reflexes made the matter plain.

In infectious diseases—as pneumonia, measles, etc.—the balanced reflex that moderates the heart's action is disturbed by the

toxins of the causal agent of disease, so that the rate of the whole heart is increased.

In auricular fibrillation this reflex is not disturbed. When the rhythm is normal the ventricle contracts only to the stimulus that arises from an auricular systole. In auricular fibrillation there is no rhythmic contraction of the auricle, but a continuous fibrillary twitching of the muscle, so that in place of the regular stimulus from the contracting auricle there is a shower of weak stimuli which assail the conducting system between auricle and ventricle and cause the rapid ventricular rate. Not only is there this difference in the cause of the increased rate, but there is a difference in the condition of the cardiac reflex. In rapid pulse with the normal rhythm the reflex is disturbed by the toxins of the diseased state, so that the digitalis can produce no effect. In auricular fibrillation the reflex is unaffected, so that the digitalis can act upon the vagus portion, and in doing so depresses the conducting mechanism to the ventricle and renders it not so susceptible to the numerous stimuli from the auricle.

In many diseases all the symptoms on which a diagnosis is based are reflex in origin—in some the reflexes are disturbed by the entrance of the stimulus through the nervous system, and in others the disturbance is through the circulation. To the former belong the symptoms of such diseases as gastric ulcer, renal calculus, gall-stone disease. The symptoms in infections are due to the disturbance of the reflexes through the circulation, as influenza, malaria, typhoid and typhus fevers, measles, and abscess formation, apart from the swelling.

In some diseases we get a mixture of both kinds of reflexes, as in appendicitis, where there is not only the local pain and tenderness of the tissues of the external body wall, with contraction of the muscles of the abdomen, but the feeling of exhaustion, rapid pulse, and tendency to vomit. In cholecystitis we get a similar complex.

The need for the more accurate recognition of symptoms is seen when it is considered how difficult it is to diagnose

even such seemingly simple affections as gastric ulcer and appendicitis. Though surgeons have been operating for these complaints for many years, the most experienced recognize that in many cases they find they have been mistaken in their diagnosis. This is due in a great measure to the fact that the nature and mechanism of the symptoms of these diseases have never been understood, and the symptoms were never clearly differentiated from those of other diseases which they resemble.

It will thus be seen that symptomatology is like chemistry, where the combination of elements results in the production of a great number of compounds bewildering in their variety. Nevertheless, as in chemistry, when they are subjected to strict analysis they can be resolved into their component elements. When the analysis of symptoms is studied as fully as the analysis of chemical compounds has been studied, then it will be possible to group the disturbed reflexes in an orderly manner. The next step then will be to find out the agents capable of provoking the different reflexes, so that we get nearer to the immediate cause of disease.

The employment of this method of investigation is but a return to those methods of clinical research which were so fruitful in their results in the past, especially during the early half of the nineteenth century. To realize how great the progress was during that period we have to consider the discoveries associated with the names of Addison, Bright, Graves, Adams, Stokes, Cheyne, Paget, Hodgkin, and Jenner. These observers employed the most useful of all weapons in research—the trained senses. What we aim at is to recognize the methods which these great observers employed, and by improving and refining their methods restore clinical medicine to the van of research.

A certain number of symptoms are due to structural changes and functional derangements. These are generally shown by physical signs, and are due to departures from the normal in various ways, as in alteration in the size and shape and

consistence of organs, changes in the color, as pallor, modification of the sounds of the heart and lungs. These are not dealt with here, but will have to be reconsidered in view of this theory of disturbed reflexes, because many apparently structural and functional signs are really disturbed reflexes, or are produced by disturbed reflexes.

The Diagnosis and Treatment of Diphtheria.

In the *Virginia Medical Monthly* for February, 1921; HARRIS states that his chief criticism of the way antitoxin is used is that it is given in too small initial doses with the idea of repeating if needed. Whenever he gives a dose of antitoxin he does it with the idea of not having to repeat it; he tries to give enough in the first dose. If the patient needs antitoxin the first dose should be big enough to do the work, and it should not be necessary to repeat it. If it is going to take 10,000 units of antitoxin to counteract the toxin in the patient, why give 5000 to-day and 5000 to-morrow or the next day? The 10,000 at once will do the work much better.

Of course, each individual case has to be treated upon its own merits, but his rule is never to give less than 5000 units in any simple tonsillar case, if seen reasonably early, and if seen after the third day he uses 10,000 units or more according to the severity of the case, it matters not how young the child is. The dose seldom has to be repeated. Many of the text-books tell us to repeat the dose in eight or twelve hours if no improvement is noted or if the temperature does not come down. As a matter of fact, there is usually a reactionary temperature from the administration of antitoxin, and in six to ten hours the temperature may be elevated 2 or 3 degrees. The beneficial effects from antitoxin are not seen in his experience until from twenty-four to thirty-six hours. He does not worry if the child is no better in twenty-four hours, for he knows from experience that if the child has been given sufficient antitoxin, it will do the work within another

twelve to twenty-four hours. He has never seen any special benefit from the excessively large doses of antitoxin that are sometimes given. Ten to twenty thousand units ought to be enough for any tonsillar case.

As to the treatment of laryngeal cases, this is the place a physician has to act promptly and do the right thing at the right time, if he expects to save his patient. It is no time to speculate or theorize as to what this persistent croup or hoarseness might be. Do not wait for the report of a culture. If the child does not improve promptly under emetics, inhalations, and sedatives, give antitoxin at once and give a large dose, at least 10,000 units in the mildest cases, and if the symptoms are at all urgent give from 15 to 25 thousand. If one has acted promptly and if the case is seen reasonably early it will seldom be necessary to repeat the dose of antitoxin.

If laryngeal diphtheria is properly treated, there should very seldom be any necessity for intubation. Most of the cases that come to intubation have been neglected in some way by somebody. This neglect is of three kinds: First, the parents may have neglected to call the physician early enough; second, the physician has neglected to make a diagnosis promptly, or third, has neglected giving antitoxin in large enough initial doses.

The Internal Pancreatic Function in Relation to Body Mass and Metabolism.

In the *American Journal of the Medical Sciences* for February, 1921, ALLEN and WISHART state that the influence of exercise on carbohydrate assimilation was traced from the normal through various stages of impairment. A rise of plasma sugar, presumably representing increased transportation, ordinarily accompanies exercise in the normal animal, and the assimilation for test doses of glucose is increased. In mild diabetes, when there is a tendency to abnormal hyperglycemia from defective assimilation of carbohydrate, exercise markedly diminishes the hyper-

glycemia and glycosuria and facilitates utilization. This power of exercise to improve assimilation applies to the glucose formed from protein diets or body stores as well as from preformed carbohydrate. It does not depend upon the febrile temperatures which attend heavy exercise in dogs, for equal results were obtained in human patients without important elevations of temperature. It is not lost with long usage, but becomes less as the diabetes becomes more severe. At a certain advanced stage exercise is unable to modify hyperglycemia or glycosuria. Beyond this, in the extreme forms of diabetes in partially depancreatized animals and in totally depancreatized animals, the extra mobilization of sugar by exercise results in an actual increase of glycosuria and of the D:N ratio.

With regard to diabetic theory, these results seem to indicate: (a) That the increased metabolism of exercise does not impose an added strain upon the internal pancreatic function; (b) that the combustion of food materials through the increased muscular metabolism and mass resulting from exercise is a definite relief to the internal pancreatic function as compared with the accumulation of such materials through inactivity; (c) that the internal pancreatic secretion is nevertheless an indispensable intermediary in such combustion, and that exercise merely enables the muscles to make more active use of such quantity of this secretion as is available to them, but cannot compensate when this quantity falls below the necessary minimum.

For purposes of practical treatment the combustion of food by exercise is preferable to its deposit in the body, but exercise cannot replace dietary restriction or permanently atone for excessive diets. The fundamental value of exercise is probably as a form of undernutrition. The combustion of calories by exercise, however, is not as beneficial as omitting them from the diet, and loses its potency at a stage when dietetic undernutrition is still effective. Impairment of sugar utilization by exercise occurs only in the extreme stages of diabetes, but in human patients the nervous

and systemic influences must also be considered. With any important degree of undernutrition heavy exercise involves undesirable fatigue and strain, but light exercise aids health. Rest is necessary in the severest cases. In the clinical application, therefore, dependence for the actual control of the diabetes is placed upon diet, and exercise is limited to the requirements of comfort and hygiene. The thorough dietetic treatment thus involves two changes from former practice; on the one hand heavy exercise as advocated by the earlier clinicians for burning up surplus sugar is discouraged; on the other hand the hygienic benefits of lighter exercise are made available to many patients to whom exercise was formerly forbidden.

Morphine in Labor.

The *British Medical Journal* of January 29, 1921, in its Reports of Societies refers to a communication on this subject made by McIlroy at a meeting of the Section of Obstetrics and Gynecology of the Royal Society of Medicine, held on January 6. The communication was based upon the results of the administration of morphine in obstetrical cases occurring in the officers' wives' section of the 82d General Hospital at Constantinople. A large number of civilian patients were also admitted for treatment, including Turkish, Greek, and Russian women. The majority of the patients were primiparæ, and the cases were not selected, but morphine was given in complicated cases, such as malpresentation and albuminuria. No vaginal examinations were made, except in cases in which complications were suspected. No douching of the vagina was carried out. Morphine was given in the form of tablets of morphine sulphate hypodermically in the upper arm. The initial dose was 1/6 grain, and repeated doses of from 1/6 to 1/4 grain were given at varying intervals throughout labor, according to the condition of each patient and her capacity for bearing pain. There was no excitement observed nor mental confusion; the patients slept at in-

tervals and awakened refreshed. The uterine contractions only showed apparent or temporary diminution, and the progress of the labor was found to be hurried rather than delayed.

After some experience of the effect of the drug, it was given, not with the primary object of allaying pain, but of shortening labor. Thirst was increased, restlessness was diminished, the third stage was unaffected, and no risks were apparent with regard to the child. No postpartum hemorrhage was observed; less fatigue and absence of shock caused a favorable convalescence after labor. The constant attendance of the medical practitioner was not required, as in the administration of scopolamine-morphine. The results were satisfactory and gave this drug a useful place in the management of labor.

Williamson, in discussing McIlroy's paper, did not agree with him as to the absence of effect on the child; in his experience, if the drug were given within two or three hours before the birth of the child, the latter was born in the condition known as oligopnea. If left alone, the child generally came round all right.

Spencer said that in his opinion and in the opinion of many obstetricians before his time, opium, in solid or liquid form, was a much better sedative in labor than morphine. He felt sure that morphine endangered the child's life when given repeatedly up to shortly before its birth. It could not be too strongly insisted upon that the repeated administration of powerful drugs as a routine measure was neither necessary nor advisable in ordinary healthy women.

Routh asked how the shortening of the first stage was caused. Was it by the lessening of the rigidity of the cervical muscle as after chloral? Apparently in the second stage there was some muscular relaxation of the pelvic voluntary muscles, and some lessening of the abdominal reflex contractions, but further observations were essential.

Lapthorn-Smith said that in all cases of primiparæ it was his practice to prescribe a

mixture with 30 grains of sodium bromide and $\frac{1}{4}$ grain of morphine to the dose, to be given as soon as labor began and repeated four-hourly. Nurses had called his attention to the excellent condition of patients after labor in these cases. He repeated the morphine by hypodermic injection when required.

Administration of Carbon Dioxide After Anesthesia and Operation.

In the *Journal of the American Medical Association* of February 12, 1921, REIMANN, BLOOM and REIMANN state that the history of patients who received carbon dioxide after anesthesia with respect to nausea, vomiting, and gas pains was carefully kept. Their judgment is, and the opinion of the deaconesses in charge of the wards is—and the latter is valuable, in that it represents the experience of many years in the handling of operative patients in active wards—that the administration of carbon dioxide does not materially hasten the recovery from the anesthetic, and does very little toward preventing vomiting and gas pains. They are convinced that nothing short of mathematical methods will discover the differences, if any. It is obvious therefore that the benefits in these directions from the use of carbon dioxide are not clear.

Hyoscines and Hyoscyamines.

In the *Journal of Pharmacology and Experimental Therapeutics* of February, 1921, CUSHNY, in summarizing his paper, states:

1. Two hyoscines, each of them racemized in the oscine component, but opposed in the direction of rotation of the tropyl radicle, were examined, and it was found that the levorotary hyoscine is fifteen to eighteen times as powerful as the dextro-rotary in action on the terminations of the nerves in the salivary glands and in other "specific" atropine effects.

2. D-hyoscine and d-hyoscyamine are more slowly destroyed in the tissues than l-hyoscine and l-hyoscyamine.

3. The action of the hyoscines on the nerve ends in striated muscle, on unstriated muscle, and on the central nervous system is identical.

4. Similar results were obtained in comparing the two hyoscyamines, except that d-hyoscyamine possesses a late stimulant effect on the spinal cord, which may be ascribed to the presence of some decomposition product rather than to the alkaloid itself.

5. It is suggested that the "specific" effects of the atropine group arise from the physical properties of some chemical compound formed with an optically active substance in the tissues, while the less specific effects may be explained by the properties of the uncombined alkaloid.

A Case of Delayed Arsenical Poisoning.

In the *British Medical Journal* of February 5, 1921, ST. GEORGE states that the length of time (three months) which elapsed from the taking of arsenic to the fatal result, the large quantity taken, and the nature of the symptoms in the slow poisoning of the nerve tissues, all make the case which he reports of interest from a medicolegal point of view, though the taking of the drug was purely accidental, and not the slightest suspicion of attempted suicide ever arose.

Mr. X., aged sixty-eight, proprietor of a grocery establishment, who carried on also an extensive pharmacy, had been under his care for some time, suffering from enfeebled action of the heart, but not sufficient to prevent him from following his usual business. At 8 P.M. on February 23, 1920, he took by mistake for a preparation of magnesia, which he was in the habit of taking for indigestion, a heaped teaspoonful of arsenic mixed with hot milk; the quantity when weighed equaled 180 grains. Half an hour later he ate a hearty supper of porridge and milk. At midnight he began to vomit, had diarrhea, and complained of a burning sensation in his stomach. The diarrhea and straining continued with increased violence until 3 A.M. When

St. George arrived at 4 A.M., he found the patient cold, with thready, rapid pulse. He was vomiting, and had watery diarrhea with great tenesmus. Water was at once rejected; the temperature was subnormal, and the pulse 120. He complained most of cramps in his legs and intestines, and a burning feeling in the pit of the stomach, with vomiting and diarrhea every few minutes. He was quite conscious, and wrote an account of how the accident occurred.

St. George decided, with a fellow practitioner who had arrived also, that it would be useless to wash out the stomach immediately, but to relieve pain and restrain the diarrhea and tenesmus they gave him an enema of a drachm of tincture of opium and of starch. This relieved those symptoms and the cramps in the legs. He was given albumen water by the mouth during the rest of the night, and then milk and barley water. There was only one motion of the bowels, and this not until late in the evening. When next seen, about 10 A.M., the temperature was normal, and the pulse 100. He was very restless, and complained of fidgets in the legs, but no cramps. The conjunctivæ of both eyes were slightly congested. No urine was secreted; a rubber catheter was passed, but no urine was found in the bladder. Diuretics were ordered, with mustard and linseed poultices to the loins in order to encourage the action of the kidneys and assist in the elimination of the poison. Magnesium sulphate was also given freely. This had the desired effect, and urine was freely passed. The patient was now able to be up and about, and soon was walking in his garden; eventually he even walked to his (St. George's) house.

The first untoward symptom that showed itself was a feeling of pain in both arms and forearms which he compared to neuralgia, for which he was given phenacetine and aspirin, with massage. This increased to a feeling of numbness in the parts supplied by the radial nerves of both hands, so that he was unable to hold a cup or spoon firmly, but he was still able to walk. It was suggested, in addition to the potassium iodide

which he was now taking, and the massage, that he should have a continuous current applied, and for this reason he was removed to a nursing home on April 30. He was then able to walk, but said his feet felt as if he were walking on wool. Very soon after he was brought there he was found to be ataxic in his gait; he was unable to stand upright if his eyes were closed, or to make an attempt to walk if his eyes were closed without falling. The knee-jerks gradually became lost and ankle clonus appeared. He became slowly but steadily worse, hypostatic pneumonia developed, and death took place on June 13 by slowly ascending paralysis. Up to the end arsenic could be found in the urine.

Massive Infection of a Vaccinated Person with *Bacillus Typhosus*.

GRANT, in the *Journal of the American Medical Association* of February 19, 1921, reports that a person giving no history of ever having had typhoid fever, but having been vaccinated with triple typhoid vaccine, received a massive dose of living *B. typhosus*. Four days later he had a headache and feeling of malaise, and on the eighth day headache and weakness. No further symptoms ever developed. On the twelfth day after infection, *B. typhosus* was present in his stools, but by the fifteenth day they had disappeared and have not been found since that time.

This case is interesting since it demonstrates that, in certain cases at least, typhoid vaccination will protect against even massive infection. The dose was enormous and must have been many thousand times the usual infecting dose. That the man was actually infected was proved by the recovery of the typhoid bacillus from his stools. But it could not be found in his blood, and at no time did he have fever. He has remained well for seventy-five days. No similar case is known to be on record.

[This is an interesting illustration of the great power of typhoid vaccine as a preventive measure.—Ed.]

Response to Pilocarpine and Adrenalin in Bronchial Asthma.

In the *Archives of Internal Medicine* for February, 1921, ALEXANDER and PADDOCK state their conclusions in regard to this subject as follows:

1. In a series of twenty cases of bronchial asthma, a general examination with routine laboratory aids and drug tests revealed no constant associated condition.

2. The most frequent finding was abnormally increased sensitiveness to pilocarpine. These cases frequently presented constitutional defects (status lymphaticus) and abnormal reactions described as characteristic of the condition called vagotonia.

3. The majority of cases reacted also to adrenalin with an abnormal rise in blood-pressure and other characteristic signs—pallor, tremor, sometimes rigor—denoting increased sensitiveness to this drug.

4. A relation between low blood-pressure and excessive adrenalin reaction was apparent, while the smaller number of cases with normal or high blood-pressure gave regularly normal reactions.

5. Cases reacting excessively to adrenalin were found to be relieved by 0.25 Cc., a much smaller dose of the drug than is usually employed.

The Induction of Abortion.

In the *Lancet* of February 5, 1921, PHILLIPS states that in spite of antiseptics and modern improvements the induction of abortion must be considered as an operation attended by definite danger. The chief risks are septicemia, sapremia, septic peritonitis, deep laceration of the cervix, followed by para- or perimetritis, perforation of the uterine wall, thrombosis, and embolus (blood or air), and the operation may often be followed by a long period of ill-health but without any definite symptoms. The procedure differs somewhat according to the period of pregnancy at which it is performed, either before the twelfth week (embryonic abortion) or from the twelfth to the twenty-eighth week (fetal abortion).

There is no doubt that every precaution

must be used in the operation, and the former common custom of producing abortion by the introduction of a uterine sound, or by injecting tincture of iodine or other fluids, is attended with the greatest risks and cannot be sufficiently condemned.

In early cases, Phillips claims the patient should be placed in the lithotomy position, the cervix pulled down with a volsellum, and, according to the operator's choice, one or more laminaria tents inserted into the cervix or rapid dilatation of the cervix carried out with graduated bougies. A pair of polypus or ovum forceps should then be introduced into the uterine cavity, and the whole mass can then usually be removed in one piece. On examination of the removed abortion, should there be any suspicion of a portion of the ovum being left behind, it is better to pass the finger right into the uterus up to the fundus, to be quite sure that the cavity is empty and that no second ovum is present. The operation may be completed by washing out the uterine cavity with tincture of iodine, one teaspoonful to the pint, or swabbing it out with iodized phenol. He does not think, however, that either of these is absolutely necessary. Packing the uterine cavity with sterilized gauze was formerly much in vogue, but is, he thinks, undesirable. Its object was to produce uterine contraction, but this is better brought about by the injection of pituitary extract or ergot at the end of the operation. Any one who has smelt the gauze removed from a uterine cavity, even twenty-four hours after the operation, will have been struck by the often offensive odor which emanates from it.

The question of performing curettage is one on which there is much diversity of opinion. Personally, unless there is some molar change in the ovum, he does not think it should be carried out as routine practice.

In the more advanced cases he thinks laminaria tents are usually preferable to rapid dilatation, and after removal of the tent and sufficient dilatation of the cervix, he inserts a specially made small de Ribes bag, which not only insures the initiation of labor pains, but in cases of placenta previa safeguards the patient from the results of

hemorrhage. As an argument in favor of this method he knows of no more difficult vaginal operation than the removal of a 16 to 20 weeks' pregnancy by means of ovum forceps after rapid dilatation. The fetus has by then attained to considerable size, but is still soft in consistence, with a much-enlarged head attached to the body by an easily torn-through neck, and in delivering the fetus the head may be left behind; this will often defy removal owing to the difficulty of seizing it with any form of forceps at present devised. Much manipulation is necessary in these cases, and bruising and skin-sloughing may result and some form of sepsis ensue.

Cause and Relief of Pain in Gastric Ulcer.

POULTON, in the *Lancet* of February 5, 1921, concludes that an important element in the pain of gastric ulcer is due to distention of the stomach, and can be relieved by means of gastric and gastroduodenal tubes. Also that some evidence has been brought forward that chronic gastric ulcer is due to intragastric pressure.

Studies on Renal Threshold for Glucose.

In the *Archives of Internal Medicine* for February, 1921, GORO and KUNO state that in order to investigate the renal threshold for glucose in Japanese, glucose tests were made on fifty-five adults.

1. In the normal adults the sugar in the blood the morning after the over night fast was between 0.066 and 0.166 per cent, in the majority of cases being from 0.08 to 0.11 per cent, with an average of 0.092 per cent.

2. The sugar in the blood nearly always increased after the ingestion of 100 gm. glucose. Thirty-three of the fifty-three persons excreted sugar, although the quantity was very small, between 0.025 and 0.795 gm.

3. Persons who did not excrete sugar averaged 0.089 per cent sugar in the blood

the morning after the over night fast. The majority showed between 0.08 and 0.09 per cent sugar. The highest percentage of alimentary hyperglycemia after the ingestion of 100 gm. glucose was between 0.114 and 0.185 per cent, the majority excreting between 0.11 and 0.16 per cent, with an average of 0.142 per cent.

4. Persons who excreted sugar averaged 0.093 per cent sugar in the blood in the morning after the over night fast. The majority excreted between 0.08 and 0.11 per cent. The highest percentage of alimentary hyperglycemia after ingesting 100 gm. glucose was between 0.128 and 0.196 per cent, the majority excreting between 0.14 and 0.19 per cent, the average being 0.160 per cent.

5. No matter whether sugar is excreted in the urine or not, the alimentary hyperglycemia reaches the maximum between forty and sixty minutes after the test and becomes normal within three hours.

6. Five persons who excreted sugar showed an abnormal hyperglycemia. The increase of sugar in the blood was quite high, 0.2 per cent, and the excretion of sugar in the urine was greater than in the other cases. Some of them showed a hyperglycemia of longer duration. However, these five individuals had neither hyperglycemia in the morning nor any diabetic symptoms.

7. Eight of the fourteen subjects who excreted sugar after the glucose test had a lowered threshold for glucose as follows: 0.122 to 0.129 per cent, 0.120 per cent, 0.122 per cent, 0.123 to 0.135 per cent, 0.139 per cent, 0.142 to 0.160 per cent, 0.146 per cent, and 0.160 per cent.

8. The renal function of those individuals whose renal threshold for glucose was lowered was normal for the excretion of water, urea, and chlorides.

9. Glycosuria appears sometimes even in normal persons owing to the lowered threshold for glucose, without any disturbance of carbohydrate metabolism. Therefore we must pay careful attention to the differentiation of so-called mild diabetes and renal glycosuria.

Bile Salts in Infantile Marasmus.

KERBY in the *Lancet* of February 5, 1921, states that his report is based on observations carried out at the Evelina Hospital in 1918 on four marasmic infants. Publication of results has been delayed until now on account of the limited number of cases hitherto investigated and the paucity of laboratory evidence corroborating clinical observations. However, Miller's recent article on "Coeliac Infantilism: Its Fat Digestion and Treatment by Bile Salts," and Armstrong's letter in the *Lancet*, 1920, ii, 1023, have encouraged the present publication, especially as the literature is peculiarly deficient in papers dealing with the clinical aspect of bile-salt therapeutics. On the other hand, there are a number of very interesting pathological investigations that have a bearing on the rationale underlying the treatment to be described.

While it appears unprofitable at this juncture to discuss the particular theories involved, it may be stated that increased fat assimilation is thought to be only one of several therapeutic effects of bile salts. It is further suggested that cases of marasmus most likely to respond to the treatment are those following acute intestinal infections and chronic disorders of the type of Finkelstein's "balance disturbance," described by Cameron as "cow's-milk atrophy."

All patients reported in his present series belong to the large group of infants showing evidence of marasmus without other physical signs. In Case 2 the presence of congenital syphilis was suspected, but could not be established. Cases 1 and 3 had a history of wasting of long duration, which in the latter case followed on an attack of infective enteritis. In no case was there any evidence of celiac disease or any macroscopic indication of fat excess in the feces. While normal as a rule, the stools were occasionally bile-stained and unduly frequent.

The average dose administered in the course of this investigation consisted of $\frac{1}{4}$ grain of the mixed sodium glycocholate and taurocholate for infants three months old. No attempt was made to investigate

the differential action of the two acids. The patient's diet was kept as uniform as possible; it consisted of pasteurized cow's milk suitably diluted.

Cardiac Massage in Resuscitation.

In the *British Medical Journal* of February 5, 1921, DOTT, in referring to an article on this same subject by Gunn in the same journal of January 1, 1921, records a case which supplements his experimental findings by some clinical observations.

An adult female suffered from carious teeth. General anesthesia was induced with ethyl chloride, and three teeth were extracted without difficulty. Cessation of respiration and sudden pallor immediately ensued. Ether was injected subcutaneously and artificial respiration begun. As the pallor increased, the heart was auscultated and found to have stopped. Artificial respiration was persisted in for about three minutes from the time of cessation of respiration in the hope that the cardiac inhibition would prove a temporary one, but it was of no avail. The abdomen was then opened, and cardiac massage begun. With the other hand artificial respiration was maintained by simple compression of the chest. Pituitrin 1 Cc. was given subcutaneously. Color almost immediately returned to the face, showing the efficacy of the artificial circulation. After about five minutes' massage, feeble spontaneous heart-beats were felt, and were supplemented at intervals by massage. About two minutes later several deep spontaneous respirations were made in rapid succession. This was at once followed by arrest of the heart, and respiration also stopped again. Cardiac massage and artificial respiration were persisted in for forty-five minutes, during which time deep inspirations were made at intervals of about ten seconds—as in morphine poisoning. At first deep, they became shallower and more infrequent, and eventually ceased.

This case is of interest in the light of the theory which Gunn has advanced. Gunn suggests that certain cases of failure in

resuscitation by cardiac massage and artificial respiration are due to vagus inhibition. In such a case the heart has commenced again to beat well, after massage; the paralyzed central nervous system, including the respiratory and vagus centers, begins to recover; spontaneous respiration begins; then the vagus center awakens, hyperexcitable after its paralysis, and cardiac inhibition results. From cardiac arrest due to this cause Gunn states that he has been unable to resuscitate animals.

In the case described this sequence of events is closely followed. The heart was initially arrested by vagus inhibition, due to stimulation of the fifth cranial nerve. Cardiac massage and artificial respiration revived the brain. Spontaneous respirations began, immediately followed by cardiac arrest, presumably due to inhibition by the recovering vagus center. If, as Gunn recommends, atropine had been administered intravenously, Dott thinks it probable that this patient would have recovered.

Surgical and Genito-Urinary Therapeutics

A Study of the Acute Infections of the Ear as Observed by the General Practitioner.

KEELER (*Journal of the Medical Society of New Jersey*, February, 1921) considers the ear as anatomically divided into three parts—i.e., the external, the middle, and the internal ear.

The external ear consists of the auricle, the external auditory canal, and the eardrum, which serves as the dividing line between the middle and the external ear.

The middle ear, or the tympanum, is a recess in the temporal bone. This recess extends into a large cavity in the base of the petrous portion of the bone and is filled with many cells; it is known as the mastoid. The tympanum is also connected with the pharynx by the Eustachian tube.

The internal ear, known as the labyrinth, has two separate and distinct functions, the acoustic and the static. Physiologically, the ear is divided into the conductive apparatus and the receptive mechanism.

It is of primary importance to determine which structures are involved; to know whether the lesion is in the conductive apparatus or in the receptive mechanism. If the lesion be in the former, or the conductive portion, the position of the obstruction must next be located. To do this it is most essential that the physician be equipped with a good light, either direct

or reflected. By practice he will be able to illuminate the external auditory canal quite skilfully, and to determine whether the inflammation exists in the auditory canal or within the middle ear.

If the meatus or the cartilaginous portion of the canal appears swollen, or if the patient be suffering severe pain, or has a sense of fullness within the ear, accompanied usually by a high-pitched tinnitus with impairment of hearing in the affected ear, or if he be very sensitive to palpation or to the manipulation of the auricle, it is more than probable that this is a case of acute circumscribed otitis externa; in plain speech, a boil. This infection may appear as a single focus, or it may be multiple; but invariably it is the result of staphylococcus infection.

If the posterior wall of the canal be involved, edematous swelling may appear over the mastoid region and is often mistaken for an acute mastoiditis. But there is this differentiation: in the case of mastoiditis, swelling within the auditory canal appears in the osseous rather than in the cartilaginous part. The swelling of the tissues over the mastoid is due to a necrotic erosion through the mastoid cortex and to an extravasation of pus under the periosteum. The auricle is less painful to manipulation, and usually there is history of earache with a purulent discharge from

the auditory canal which may or may not have ceased. There is usually some elevation of temperature; and finally, a roentgenogram would determine whether a necrotic disintegration of the mastoid cells is in progress.

Involvement of the anterior wall of the canal has frequently been misjudged for inflammation of the parotid gland—"mumps." Owing to the proximity of the condyloid joint, mastication is extremely painful or almost impossible, and this condition is to be regarded as helpful in diagnosis.

The best methods of treatment of this infection consist of incision (preferably under gas anesthesia), disinfection, and drainage. Gauze tampons impregnated with camphor and phenol should be introduced into the canal. There should be applications of hot antiseptic fomentations, because "moist heat favors local necrosis and hastens the reparative process." Rest in bed should be secured, and the pain alleviated by the administration of a narcotic. The diet should be concentrated liquids.

A diffused otitis externa or an otomycosis is caused by a fungus, the aspergillus, and is characterized by the sickening sweet odor of a yellowish or dark-brown secretion within the auditory canal. The best results are obtained by frequent irrigation of a strong alkaline solution, and by a direct application of a 20-per-cent solution of silver nitrate, which should be applied once daily until fungi are destroyed.

Foreign bodies within the auditory canal are not properly classified as acute infections. Of the animates, an insect is likely to be the one most frequently found embedded in the tissues of the canal. In such instances the life of the intruder must be destroyed before any attempted removal is made. Drowning is one of the best methods, and is accomplished by having the patient lay his head on the side opposite the one involved. Then fill the auditory canal with water, or better some mild antiseptic solution; or use a few drops of alcohol.

Inanimate objects influenced by heat and

moisture, consequently swelling, may be readily shrunk by dropping into the auditory canal alcohol sufficient to shrink both the tissues and the foreign body. Irrigation with a good syringe should follow.

Infections of the tympanum not relieved in the early stages lead to serious and permanent complications in the conductive apparatus, and not infrequently in the receptive mechanism. The infection may be acute or chronic catarrhal; acute or chronic suppurative; but in all cases the etiology is very similar. The engorgement of the mucosa within the tympanum and the closing of the Eustachian tube prevent the escape of the rapidly forming exudate, which soon becomes infected, if it is not so at the onset. This is especially true if it be associated with any of the acute infectious or exanthematous diseases, such as influenza, pneumonia, measles, or scarlet fever. Other predisposing causes are adenoids, decayed teeth, and acute and chronic diseases of the tonsils and sinuses; deformities and neoplasms producing venous stasis, which interfere with free nasal respiration and render those so affected more susceptible to climatic changes. Marasmus in children, tuberculosis, syphilis, acute interstitial nephritis and diabetes are also predisposing elements of chronicity in middle-ear infections.

The ear-drum may be likened to the safety-valve on a steam boiler, with this difference: when the pressure within the boiler reaches a certain degree an automatic device reduces the pressure and the impending danger is averted. But in the ear there is no such device. The Eustachian tube is sealed. There is no escape through that channel for the accumulated infected serum or pus held within the middle ear, and an explosion, the spontaneous rupture of the ear-drum, occurs. The edges of the ruptured drum are irregular necrotic lacerations.

If nature should eventually repair the drum, there remains an area of cicatricial tissue with marked retraction and an impairment of hearing. In the meantime, owing to the contiguity of the structure, the

infected serum continues to extend into the upper portion of the tympanum, where it is very likely to become purulent because of the greatly increased quantity of cellular structure. Finally, the overflow passes into the mastoid, whose numerous cells serve as a reservoir. Local necrosis of the bone, accompanied by severe mastoid involvement, has very probably taken place; or there may have developed a chronic suppurative process with polypoid degeneration and all its attending perils.

So in middle-ear infection the course to pursue is clearly indicated. Therefore do not delay operation until the explosion occurs, but make a free incision in the eardrum, through that portion presenting the greatest bulging, which indicates, of course, the point of greatest pressure. In that way only can complications and disastrous consequences be forestalled.

It is a common belief that if the earache has ceased and the ear discharges, all danger is over; this misinterpretation has been the direct cause of much suffering and of many grave intracranial complications. Too frequently we meet those cases in our clinical experiences.

Whenever a purulent discharge from the ear resists the usual and established methods of treatment, even though the classical symptoms such as pain, tenderness, swelling and discoloration of the tissues over the mastoid be absent, let us ever be heedful to the demand for immediate surgery of the mastoid.

Amputations.

CORNER (*Lancet*, Jan. 15, 1921) believes that the experience of the recent war has been particularly serviceable in leading to better methods in teaching and practice of amputations.

Beginning with leg amputations, from amputations at the metatarsophalangeal joints to a high Syme above the ankle-joint, all have gone. No longer will student or teacher be bothered with the operations of Lisfranc, Chopart, Pirogoff, Roux, Tripiet, Skey, Hey, etc. The high Syme, which gives a very good stump, will remain; the

patient will learn to walk well and be nearly as active as he was before. By losing the front of a foot, the patient has lost all spring; moreover, the artificial limb is an unsightly nuisance, the ankle being much broader than the normal ankle and necessitating odd boots. In some instances the tendo Achillis becomes attached to the scar and tilts the stump forward, making the patient bear on the scar and rendering the stump useless. The foot, being largely a passive agent for transmitting pressure, is therefore easily and satisfactorily replaceable, so that the operation is likely to be largely replaced by the easier and more satisfactory one through the middle of the leg.

From accounts given by patients, those who have been amputated through the middle of the leg get along nearly as well as do those who have had a "Syme," whilst they also avoid unsightliness and expensive upkeep. In this amputation the scar must not be terminal; the operation is done with anterior and posterior skin flaps. The former is the larger, making the scar posterior. In this way the amputations of Teale, Hey, and Faraboeuf are dispensed with. Ascending the leg, Stephen Smith's operation, together with Price's modification of it, is gone from useful knowledge and practice. The retention of the patella, as in the operations of Lister, Gritti, and Stokes-Gritti, is not asked for or desired by the limb-maker. Moreover, it has been learned that the patella often becomes loosened and drawn forward by the quadriceps, making the stump and the operation useless. All that remains in the thigh is amputation with anterior and posterior flaps with a posterior scar, like a Carden, but higher up.

Perhaps the greatest change has been evolved at the hip-joint. Esmarch's modification of Furneaux Jordan's amputation was more widely taught than any other method, but it was soon found to yield a large, bulky, useless stump, including irregular and new-formed periosteal bone, which had to be reshaped at a further operation in order to remove all redundant soft tissues. The new operation is amply de-

scribed in Martin Huggins's excellent book on amputation stumps, and is somewhat like the amputation at the hip-joint, advocated by Sir Frederick Treves, surgeon, and Faraboeuf, anatomist. It will suffice here to say that skin-flaps are used, and muscles are cut short; by sawing through the neck of the bone the femoral head is left behind, filling the acetabulum instead of leaving a hollow cup behind. It is really an amputation through the neck of the femur by means of an anterior racquet incision. The triradiate scar is anterior, pulling the skin flap tight over the tuber ischii so as to leave it prominent, and giving the limb-makers no excuse for a badly fitting limb. The soft parts are cut so short that they cannot push the artificial limb off the tuber.

Thus of all the many amputations at the hip-joint only one remains. It is usually performed after an amputation of the thigh, to adapt the patient for the work of the fitter. Further, the student has not even to remember any name in connection with the operation.

It is no use operating less than three inches above or below the level of the knee-joint. In the thigh there is an anomaly, the man with a long stump and a long bony lever has to lift a lesser limb and lighter weight than does the man with a short stump and a short bony lever. This is a wrong state of affairs which can only be met at present by supplying the short thigh-stump man with a very light, strong artificial limb. If this should prove uncontrollable it can easily be altered. Hence it is no use operating to divide the bone less than three inches below the lesser trochanter. Let the amputation be done through the neck of the femur and the man will walk farther, better, and with less aid from a stick.

The upper limb is not restricted to weight-bearing; its skilled and active uses have spurred the ingenuity of men in replacing it.

Amputations of the upper limb have been immensely simplified; all forearm amputations are now done with equal anterior and posterior skin-flaps and circular divi-

sion of muscles and bone. It is no use amputating less than three inches below the elbow. Such an amputation is treated and fitted with an above-elbow artificial limb. Amputations of upper arms are done with a circular incision, which, as it nears the axilla, is met by an internal incision along the vessels, making the circular amputation racquet-shaped. At the shoulder-joint the amputation is carried out similarly. All names are gone. Nothing useful can be fitted to a short upper-arm stump; a long upper-arm stump can be made very useful, and a forearm stump is excellent. It is a very great loss for a man to lose his elbow-joint by reamputation; the stump should always be considered by surgeon and instrument-maker before anything is done.

In the lower limb there remain (1) amputations of toes; (2) a Syme's amputation; (3) through leg amputations with skin-flaps; (4) amputations of thigh with long anterior and short posterior flap; and (5) a new amputation through the neck of the femur with skin-flaps. In the upper limb there remain (1) amputations of fingers; (2) amputations of forearm with equal skin-flaps; (3) a circular amputation of upper arm; and (4) Spence's amputations at shoulder. Amputations through the knee- or elbow-joint have been shown to be inferior to others and are to be discarded.

On the End-results of Colectomies for Intestinal Stasis.

SHEEN (*British Medical Journal*, Jan. 22, 1921) reports the results of complete colectomies performed in the year 1913-'14. There were four patients, one of whom died soon after operation. If the very wide usefulness claimed for this operation is justified it ought to be widely practiced; the reasons for its necessity, its results, immediate and remote, and its mortality cannot be too well known.

The first case, twenty years old at the time of operation, when seen six years later, to wit, March, 1920, was at work as

a bricklayer. In the last six months there were occasional pain and diarrhea, with a large divarication of the recti, for which he wears a flannel binder. Proper support was provided, and it was suggested that the patient have his teeth extracted. These beneficent measures made him feel better.

The second case was thirty-four years old at the time of operation, to wit, March 2, 1914. Six years later (April 20, 1920) she feels a different woman. Her friends state that she has "cleared wonderfully." She has borne two children since her ordeal. Within the last few months she has begun to suffer from lower abdominal pain and constipation incident to pregnancy.

The third case, twenty-four years old at the time of operation, about six years later felt like quite a different person, stout and well, with the exception of occasional attacks of diarrhea, which the examining doctor believed to be neurotic.

The fatality was due to infection. Sheen states that despite his good results in these three cases he is not enamored of this operation. He points out the benefit derived from operations such as nephropexy, the possibility of reporting favorable results from almost any surgical procedure, and concludes that colectomy is not a measure likely to be widely received and practiced.

Malignant Growths of the Upper Jaw and Antrum.

DAVIS (*Lancet*, No. 22, Volume II, 1920) makes a survey of 39 cases of malignant growths of the upper jaw and antrum. Most of these growths were squamous carcinomata beginning at the ethmoid and spreading along the orbital plate or roof of the antrum, whilst a few originated in the orbital plate itself. The soft, friable, suppurating growth, taking the line of least resistance, filled the antrum, then eroded and absorbed its walls and sprouted through the thin orbital contents and capsule of Tenon.

In 18 cases of squamous carcinoma of the upper jaw five killed the patients in about six months, and others, when ruthlessly and,

apparently, completely excised, recurred within twelve months after operation.

As to the endotheliomata or columnar-celled carcinoma, there were seven of them. They all arose in the ethmoid. Section of columnar-celled carcinomata may occasionally resemble endothelioma and are occasionally described as such. There were seven of these cases, and some were known to have recurred after operation in three to five and a half years.

There were three papillomatous growths which occurred in the region of the inferior turbinal, and were more benign than malignant, but recurrences occurred at long intervals.

There were four cases of so-called round-celled sarcoma originating in the ethmoid and occurring in patients of about forty years of age and upwards. They were clinically identical with the squamous carcinoma. The disease recurred in all cases operated on.

There were two cases of chondrosarcoma occurring in young subjects about the age of sixteen. This type was invariably inoperable. There were two cases of spindle-celled sarcoma, with a few amyloid cells apparently commencing at the antro-nasal wall or palatal process. They did not recur from five to eight years after operation. There was one melanotic sarcoma which originated in the vestibule of the nose. There was one definite case in which it could be shown that the growth originated in the mucoperiosteal lining of the antrum.

The commonest first symptom is a persistent pain in the cheek radiating to the forehead or temporal region, accompanied by a blood-stained discharge from one nostril in an elderly patient. The teeth are frequently blamed for the pain and are extracted. Severe epistaxis, not arising from the usual causes, with pain in the cheek, should raise suspicions of a growth. In this series of cases the average duration of such symptoms before the patient was seen was three months. An examination of such a case revealed a vascular polypoid-looking swelling in the middle turbinal region which bled freely when probed.

Transillumination showed a dark antrum, and an x-ray photograph demonstrated a still more definite opacity of that region. If there is any doubt after such findings, exploration of the antrum with preparations for excision of the upper jaw is advisable. Later symptoms were proptosis, epiphora, and expansion of the walls of the antrum, and finally, too late, a puffy swelling of the cheek below the infraorbital margin.

The operations carried out by the writer have had the following underlying principles: (1) A thorough exposure of the growth to ascertain its limits as far as possible; (2) complete excision of the growth together with a free margin of healthy tissue. The orthodox anatomical operation of excision of the upper jaw was discarded. The teeth are put in order by a dental surgeon as soon as possible after the first visit, and if it is anticipated that half of the palate will have to be removed, a denture or obturator is made and inserted immediately after the completion of the operation. Permission is obtained from the patient to enucleate the eyeball if a more thorough clearance of the orbit and ethmoid is likely to be required, and in two of the above cases the eye on the affected side became blind soon after a recurrence was noticed. Intratracheal ether is the most satisfactory anesthetic, and was employed without any disadvantage in all the later cases. A preliminary laryngotomy was employed in four of the first cases with plugging off of the pharynx, but the patients did not make a rapid recovery, and appeared to feel the effects of the operation more than those who had intratracheal ether. The usual Fergusson incision was made from the frontonasal suture down the side of the nose and through the upper lip. The cheek was then reflected upward and backward as far as possible. The horizontal portion of the incision along the infraorbital margin was omitted because it did not give much more access to the area of operation, and leads to the unsightly deformity produced by edema of the lower eyelid. The nasal bone, nasal process, and facial surface of

the maxilla as far as the malar were removed to expose the growth, and if the palate was not involved, the floor of the orbit with the growth was scooped out. In the cases of carcinoma, when the floor of the main mass of the growth was removed portions of it were generally found in the ethmoid, and the ethmoid was vigorously attacked with punch forceps and spoon until the inner wall of the orbit as far back as the sphenoid and up to the base of the skull had been removed. The contents of the orbit were examined, and occasionally growth was found adherent to the capsule of Tenon. In two cases only was it necessary to remove the palate, and then the more common operation of excision of the upper jaw was carried out.

If possible, the mucoperiosteum of the palate should be saved to form a flap to close off the mouth from the nose, and if this is done patients make a more rapid recovery. In the older patients the interference with the mouth and the taking of food when the palate is removed adds considerably to the severity of the operation. A recurrence in the palate has not been seen. The hemorrhage was not dangerously excessive. Preliminary ligature of the external carotid artery was done in two cases only, and was considered unnecessary unless a dissection of the glands in the neck was carried out as the first stage of the operation. So experienced an operator as Butlin did not approve of a preliminary ligature of the carotid. All the patients made a rapid recovery, and not one died from the immediate or remote effects of the operation.

The Significance of Shoulder Pain in Lesions of the Upper Abdomen.

COPE (*Proceedings of the Royal Society of Medicine*, February, 1921) observes that shoulder pains are never felt in liver abscess unless the pus is near to or threatening to perforate the diaphragm. He reports the case of a man who whenever he lay down in bed felt a severe pain in the

right supraspinous fossa. This pain persisted until he was operated on. He was suffering from the perforation of an ulcer about the junction of the first and second portion of the duodenum, with a considerable amount of plastic lymph in the subhepatic region. The pain disappeared after operation.

A few days later a second patient with symptoms of perforating ulcer stated that every time he coughed he had a severe stabbing pain in the right shoulder and referred to the right supraspinous fossa and less severely to the supraclavicular region. Operation showed a perforation of a pyloric ulcer. The signs of inflammation were here most distinct in the subhepatic region.

Some time later the reporter saw a patient with symptoms suggesting intra-abdominal lesion. The illness began when the patient awoke at six o'clock with acute stabbing pain in the right subclavicular fossa. On examination nothing was found in the abdomen, but below the right clavicle was a very hyperalgesic area, and on auscultation of the chest a soft, sticky and evidently pleural crepitation could be heard at the lowest level of the right pleura in front. A diagnosis of diaphragmatic pleurisy was confirmed by the further course of the disease.

The author reports a number of interesting cases and suggests that the cause of pain in the shoulder in abdominal lesions is irritation of the diaphragm, not of the abdominal viscera.

That unilateral irritation of the diaphragm causes pain over the corresponding shoulder.

Acute bilateral shoulder pain indicates a median irritation of the diaphragm and commonly results from a perforated gastric ulcer.

There is a correspondence in the distribution of the descending cutaneous branches of the third and fourth cervical nerves and that of the phrenic nerve on the same side. The pain caused by irritation of the front of the diaphragm is referred to the clavicular or subclavicular region, of the dome to the acromio-clavicular or acromial

region, and of the posterior portion and crus to the supraspinous fossa.

Pain on the top of the shoulder is likely to be of diagnostic value in subphrenic abscess, diaphragmatic pleurisy, actinomycosis of the chest, liver abscess, and possibly some cases of acute pancreatitis.

Regional Anesthesia with Special Reference to "Splanchnic Analgesia."

LABAT (*British Journal of Surgery*, January, 1921) regards pure novocaine adrenalin solutions as the safest. A needle should never be previously fitted on to a syringe when it has to be introduced into the vicinity of large vessels. A small hematoma caused by the accidental wounding of the blood-vessels is of no importance. A surgeon should wait at least ten minutes to obtain the full anesthetic effect. Gentle handling should obtain during the operation. Local infiltration is accomplished in the accustomed fashion, to wit, five anesthetic wheals are raised: the first, at the tip of the xiphisternum; the second and third, one on each side, at the level of the tenth costal cartilage, where the external border of the rectus crosses the costal margin; the last two, one on each side, on the external border of the rectus, a little higher than the umbilicus.

The needle (8 or 10 cm. long) is then passed through each wheal in turn, and infiltration made fanwise. The deep layers should be infiltrated before the more superficial. The solution is injected within the rectus sheath: this is quite sufficient to anesthetize the underlying peritoneum, and gives a good relaxation of the abdominal wall. The infiltrated area should be lightly massaged to spread the solution within the tissues.

For splanchnic analgesia the patient should lie on his side with the back arched. Place a cushion under the loin if the spine is too much bent sidewise; the relaxation of the muscles thereby obtained renders the landmarks more accessible, and makes the subsequent steps of the technique easier.

Define the twelfth rib and the first lum-

bar spinous process. On the lower border of this rib, four fingerbreadths or 7 cm. from the middle line of the back, raise an anesthetic wheal, through which pass a needle 12 cm. long, along the horizontal plane of the body, *i.e.*, vertically to the table on which the patient is resting.

Introduce the needle obliquely forward, so that it makes an angle of about 45 degrees with the median plane. Its point then strikes the body of the vertebra near its anterior convexity, behind the splanchnic nerves, just where these join the semilunar ganglion. When the needle, introduced for about 9 cm., has struck the bone, it should be drawn back until its point lies in the subcutaneous tissue (so as to be able to change its direction), and reintroduced at a smaller angle. If its direction is good, the needle passes tangentially to the body of the vertebra. As soon as the point of this needle is felt to glide along the surface of the vertebra, it should be pushed in one centimeter further; and, after making sure that no blood comes out of the lumen, there should be injected 25 to 35 Cc. of a one-per-cent novocaine-adrenalin solution (novocaine 1 grm., adrenalin 25 drops of a 1:1000 solution, and normal salt solution 100 Cc.). The patient is then asked to change sides, and the injection is repeated on the opposite side.

The solution spreads easily into the loose retroperitoneal tissue, diffusing in all directions, reaching the solar plexus and its immediate tributary as well, thus anesthetizing a wide area in which all operative maneuvers become painless. But we should not lose sight of the fact that novocaine produces, beyond its field of action, a ring of hyperesthesia, on which distant pulls may give rise to painful impulses, thus bringing about the tendency to believe that the technique has proved a failure.

Either at the precise moment of injection or appearing a little later there is a slight acceleration of the pulse; in one case bilious vomiting with slight cardiac distress occurred. These symptoms are of short duration (two to five minutes), and are followed by no untoward effects. In

two instances a partial anesthesia of the lower limbs was obtained, due probably to want of technique at the very outset of the experiments. The last series of 25 cases was gone through without the slightest trouble to any concerned.

The many difficulties attending the performance of complicated and extensive operations in the abdomen render it absolutely impossible to rely on the ordinary local method, though the poor and weakened condition of some patients often urges on the surgeon the importance of inducing regional anesthesia. This method is easy, simple, and safe, and should be attempted as often as possible.

Experimental Investigation of the Results of Linear Division of the Pyloric Sphincter.

PANNETT (*British Journal of Surgery*, January, 1921), recognizing that the simple division of the pyloric sphincter is now the established method of treatment in congenital hypertrophic stenosis of the pylorus in infants, recalls the circumstance that the belief that a division of the muscular wall of any part of the gastrointestinal tract which leaves a gaping wound filled only by the protruding mucosa might be a practical and well-advised measure to take, was at first difficult to adopt, so hazardous and contrary to the accepted methods of intestinal surgery did it seem. The clinical results were, however, conclusive. Pannett conducted a number of laboratory studies, employing therefor cats. He concludes as the result of his studies, supplemented by radiograms, that the operation of simple division of the normal pyloric sphincter leads to a certain initial increase in the rate of passage of food through the stomach, and a probable earlier complete evacuation of this viscus; secondly, that these effects may be temporary or permanent according to the method of healing of the wound. Either tone and function will return to the muscle ring, as it does after a similar incision of the anal sphincter, a narrow linear scar alone remaining at the

site of operation; or the partitionary power of the pyloric sphincter will be lost permanently, with perhaps the formation of a shallow diverticulum of the canal.

It is possible that this sphincteric operation might improve the altered gastric function in three clinical conditions. They are the cicatricial contraction following ulcer at the pylorus, the spasm of the pylorus associated with ulcer of the body of the stomach, and hyperchlorhydria. Graham has performed the operation for the first of these conditions, but after-results are still awaited. In the case of spasm due to an ulcer of the body of the stomach, relaxation of the sphincter might lead to earlier evacuation of gastric contents, and a lowering of gastric-juice acidity, due to regurgitation of duodenal contents. Boldyreff asserts that in hyperchlorhydria the normal reflux of duodenal contents through the pylorus into the stomach does not take place, and this suggests that in such cases a higher percentage of hydrochloric acid is necessary to provide the adequate stimulus to pyloric relaxation. The tone of the sphincter, and so the necessity for such high acidity, would be abolished by sphincteric division. The conditions suggested as forming a profitable field for exploitation of the procedure would call for a permanent diminution of sphincteric control, if any benefit accruing from it were to be lasting. The operation for such cases would have to be modified accordingly. To attain this end, one of two stratagems would probably be effective, judging by analogy of what happens in operations upon the anal sphincter: the interposition of a wedge of omentum between the two extremities of the cut muscle band, or an oblique division of the sphincter.

One other question must be touched upon. Is any harm likely to come from a diverticulum should one form at the site of operation? The answer to this question can only be given after a sufficient trial; but it would seem to be this, that however fraught with danger diverticula may be in the colon or other regions of the alimentary canal, such abnormalities have been recog-

nized for years as occurring occasionally in the duodenum, but their presence has never been correlated with recognizable symptoms.

Seminal Vesiculitis: Its Local and General Manifestations.

CUNNINGHAM (*International Journal of Surgery*, February 1921) after discussion of this infection, in which he gives full credit to Dr. Eugene Fuller for its proper surgical treatment, states that the management of focal infection in the prostate and seminal vesicles associated with metastatic manifestations does not differ from that of such infections without the metastatic disturbances except for the employment of gonorrheal vaccines, supplemented by certain orthopedic features when these are indicated to relieve local suffering. The cure, of course, depends upon the destruction of the focal infection in the deep genital organs. This may be accomplished by non-operative measures, in the form of prostatic and vesical massage, irrigations and instillations, vaccines and general treatment. Non-operative treatment is effective in about ten per cent of patients with real gonorrheal arthritis. In the mild cases palliative treatment as a rule is slow, recurrences are prone to occur, and the individual must be considered to be infectious until proven otherwise.

If non-operative treatment does not show satisfactory progress after a trial of weeks or months, the infection should be attacked by the surgical removal of the foci of infection.

There is no operation for a chronic condition that gives more brilliant results. With the removal of the foci of infection, the pain has disappeared from the affected joints of some patients at the time of the other recovery; large, swollen joints have become normal in appearance, or nearly so, and painless voluntary motion is often possible within twenty-four to forty-eight hours after operation. The periarticular swellings disappear much more rapidly than those which are intra-articular, and when

destruction in cartilage and changes in bone have taken place, as may be expected if the articular lesions are of long standing, a considerable period of time and appropriate accessory treatment are necessary to repair such defects. Nevertheless, the activity of the process is arrested with the removal of the foci of infection and the repair process may begin.

The indication for operative treatment is a failure to produce a cure by non-operative measures. Cunningham has performed vesiculectomy or vesiculotomy with prostatotomy on about two hundred patients, and has yet to learn of one who has become permanently impotent.

In connection with the matter of sterility it is probable that a large percentage with advanced seminal vesiculitis and prostatitis are sterile because of the lesions, and the operation does not add to the damage already done. Whatever the unknown truth of this feature may be, it is certain that most patients with seminal vesiculitis and prostatitis must be considered infectious to others; and moreover, those with real gonorrheal arthritis, that is so severe as to require operation, think little of sexual life, and, being infectious, should not be permitted to if they did. Most are chronic invalids with impaired general health, and when given the choice of being made useful individuals at the expense of reproduction (which they have probably lost anyway from the lesions), there has never been any hesitation in accepting the chances of cure by operation.

In performing the operation both the seminal vesicles and the prostate should be attacked, for there is abundant clinical and pathological evidence to show that infection may be expected to exist in both.

Likewise it is necessary in attacking the seminal vesicles that every focus of infection be destroyed. For that reason multiple puncture sometimes fails in its purpose. When possible it is probably safer to extirpate the vesicles, or if not to remove the entire posterior surface and sterilize every portion with carbolic acid and alcohol.

Nothing short of a complete removal of

all foci of infection will give the desired result; and while to accomplish this it may be necessary to thoroughly destroy the vesicles, the prostate needs only free drainage by multiple incisions.

Radium in the Treatment of Sarcoma and Carcinoma of the Bone.

NEILL (*American Journal of Surgery*, February, 1921) states that up to the present time but 4 per cent of cures have been reported following radical operation for central periosteal sarcoma of the bone, the commonest cause of death being metastasis to the lung, not a local recurrence.

This raises the question of careful *x-ray* examination of the lungs and mediastinum in every instance before an operation. *X-ray* examination of other bones of the skeleton should also be made. We can now hold out a little hope since radium has sometimes destroyed the disease and allowed a formation of healthy callus. Three methods of treatment are followed: First, implantation or burying of radium emanation directly into the disease (from 1 to 3 millicuries) contained in minute glass capillary tubes, which are left permanently embedded. Second, massive treatments from the surface at a variable distance of from one to four inches with from 1 to 4 grammes of radium. Third, laying bare the diseased tissue by operation and inserting, under inspection, a large amount of radium into the tumor, while the patient is under the anesthetic.

The first method seems to be the most destructive to the local disease and the most effective. It is painless, causes no severe reaction, and does not necessitate the patient's detention in the hospital, as in the open wound plan.

The approximate dosage for the needles, points, or spicules, containing emanation, is 2 millicuries of emanation for each 4 cubic centimeters of disease for implantation; 5 gramme hours at 2 inches distance for each three square inches of surface, when treated from the exterior; one-half gramme hour direct treatment when placed

under inspection in the center of the disease.

In almost every case partial or complete relief of pain is observed; there is also a decrease of swelling in the soft parts, with increased function and improvement in health. Three cases are reported.

Some Toxicological Aspects of Surgical Rubber Goods.

GALLAND (*New York Medical Journal*, Feb. 19, 1921) observes that reports of unexplained reactions following intravenous medication have been frequent in recent medical literature. He states that Stokes and Busman traced some untoward reactions following arsphenamine injections to a certain brand of rubber tubing.

Galland holds that from the view-point of the rubber manufacturers it is possible to make rubber products free from any deleterious ingredients. These substances are not prerequisite to the compounding of superior rubber products, and such a product should be insisted upon. A tentative specification might be proposed in outline. Rubber goods intended for use within body cavities or in contact with body surfaces should be compounded of high-grade new rubber, preferably Para or plantation rubber. The use of reclaimed rubber, boiled or oxidized oils, or rubber substitute, should be prohibited. No filling ingredients containing lead, antimony, arsenic, chromium, or other poisonous substance should be permitted. Such compounds would be free from the dangers discussed in this paper.

Meatotomy.

ARONSTAM (*American Journal of Surgery*, March, 1921) describes the technique he has found efficient. A sharp scissors, either curved or straight, a few hemostats, a fine wick of gauze, a probe, a four-per-cent solution of procaine, solution of adrenalin, 1 to 1000, and dressings, are all that are required. A pledget of cotton, well saturated with the procaine solution, is inserted into the meatus and retained for ten

minutes; the glans is well sterilized with sublimate of lysol solution, the pledget of cotton is then removed, and the meatus is lightly touched with the point of the scissors, to determine whether its sensitiveness has been thoroughly abolished. If it still remains sensitive, we must repeat the procainization of the meatus. The scissors are then introduced into the meatus, the penis elevated at right angles with the body, the lower blade impinging upon the mucosa, the upper blade externally to it in juxtaposition to the lower blade; and thus bringing the blades together with one sweep, the meatus is divided.

The Abortive Treatment of Gonorrhea.

ROSENTHAL (*Urologic and Cutaneous Review*, February, 1921) states that if there is only a burning sensation, but with also the presence of gonococci or a few drops of gonorrheal pus, two injections may succeed in curing the gonorrhea completely in two days. Blaschko recommended this method in 1901, and himself employed it for twenty-five years. The results are positive when treatment is instituted in the very beginning, and the chances of later complications are lessened. If the patient is not seen in the very earliest stage we must be guided by the microscopic findings. If most of the gonococci are intracellular, if the urethral meatus is inflamed and the first urine is quite turbid, the method is not employed.

The technique is as follows: A 2-per-cent solution of albargin is injected by means of a urethral syringe into the anterior urethra and allowed to remain there for a moment. It is then expelled. After this preliminary injection the same strength solution is again injected and allowed to remain for one and one-half minutes. The urethral meatus is now compressed with the fingers to retain the solution, and a further injection of the 2-per-cent albargin solution is now made under somewhat greater pressure. The whole treatment should not take longer than three minutes. On the next day the same procedure is repeated with the same strength of albargin

solution, or in the event of irritation as well as negative gonococcic findings, with a 1-per-cent albargin solution.

The treatment is seldom painful, so that anesthesia is unnecessary. If on the second day pain occurs, this may be overcome by an injection of a 2-per-cent alypin solution.

If on the third day gonococci are present in the discharge the cure has not been successful, though no harm has been done to the patient, and one may then try either daily Janet irrigations or institute usual treatment. If, on the other hand, gonococci are absent on the third day and if they remain absent for the next ten days, cure of the gonorrhea has been successful.

That this is not a superficial and temporary disappearance of the gonococci is proved by the writer's experience that in patients so treated a provocative procedure, by means of which any possibility of infection may be determined, after an interval of twelve days, has been negative.

Deep Radiotherapy.

In a leading article in the *Lancet* of February 12, 1921, it is stated that there is at present no way of measuring the dose of radiation absorbed by a tumor situated at a depth in the body. Only those rays which are absorbed can produce chemical and physical changes, and it is only the amount of radiation that is absorbed by irradiated tissues which should be included in the term dose. In this connection some misconception has arisen as to the virtue of very penetrating x -rays; it has even been said that in the case of very penetrating rays the amount absorbed by the tumor cells is negligible. As a matter of fact the amount absorbed may be quite large. A beam of x -rays issuing from a bulb, at an alternative spark-gap of 10 inches, consists of a mixture of rays, generally spoken of as soft, medium, and hard, the hard type predominating with this gap; some measure of the intensity of this composite beam can be made photographically. A sheet of aluminum 10 mm. thick, interposed in the path of the beam, has the effect of weeding

out all but the hard rays; the beam passing through such a filter is practically homogeneous, but its intensity would, on measurement, be found to be reduced to about one-fifteenth of its original value. If we use for our intensity meter a strip of photographic paper, it is only the small fraction of radiation absorbed by the paper which determines the tint. Prolong the exposure in the second case fifteen times, and the resulting tint will be the same as before; the film has been made to absorb the necessary amount of the penetrating x -rays to give the same result. Hence, in dealing with very penetrating x -rays or the still more penetrating gamma rays of radium, the difficulties of getting the requisite dose into a deep-seated tumor do not arise from the degree of penetrating power; they arise first from the limited tolerance of the human skin to these rays, and secondly from the diminishing intensity of the rays as the distance from their source increases.

Overdosage of the skin is avoided by employing multiple ports of entry, the rays converging from various directions upon a deep-seated tumor. A gradual fall in intensity through the tissues takes place, however, not only because of the increase in distance from the source, but also because of the absorption of the beam by each successive layer; and this variation will be minimal when the penetrating power is maximal. By using a very hard x -ray bulb (say 12 inches spark-gap) at a distance of 30 cm. from the skin of the patient, and filtering the rays through 10 mm. of aluminum, the ratio of intensities at 1 and 10 cm. depth in the tissues would be about a 100:30. This may indicate to some extent how difficult it is to obtain uniformity of radiation throughout a tumor mass; and if no real uniformity exists we may well ask what is meant by the term "dose of x -rays administered." An analogy would be the oral administration of a dose of strychnine; a rather difficult physiological inquiry would be needed to determine how much reaches a certain organ. We have not even arrived at this stage in our radiation measurements. Though it is true that

ple and well settled, although not always easy of application. A physician and surgeon, by taking charge of a case, impliedly represents that he possesses, and the law places upon him the duty of possessing, that reasonable degree of learning and skill that is ordinarily possessed by physicians and surgeons in the locality where he practices, and which is ordinarily regarded by those conversant with the employment as necessary to qualify him to engage in the business of practicing medicine and surgery. Upon consenting to treat a patient, it becomes his duty to use reasonable care and diligence in the exercise of his skill and the application of his learning to accomplish the purpose for which he was employed. He is under the further obligation to use his best judgment in exercising his skill and applying his knowledge. The law holds him liable for an injury to his patient resulting from want of the requisite knowledge and skill, or the omission to exercise reasonable care, or the failure to use his best judgment. The rule in relation to learning and skill does not require the surgeon to possess that extraordinary learning and skill which belong only to a few men of rare endowments, but such as is possessed by the average member of the medical profession in good standing. Still he is bound to keep abreast of the times, and a departure from approved methods in general use, if it injures the patient, will render him liable, however good his intentions may have been. The rule of reasonable care and diligence does not require the exercise of the highest possible degree of care, and to render a physician and surgeon liable, it is not enough that there has been a less degree of care than some other medical man might have shown, or less than even he himself might have bestowed, but there must be a want of ordinary and reasonable care, leading to a bad result. This includes not only the diagnosis and treatment, but also the giving of proper instructions to his patient in relation to conduct, exercise, and the use of an injured limb. The rule requiring him to use his best judgment does

not hold him liable for a mere error of judgment, provided he does what he thinks is best after careful examination. His implied engagement with his patient does not guarantee a good result, but he promises by implication to use the skill and learning of the average physician, to exercise reasonable care, and to exert his best judgment in the effort to bring about a good result."

Napoleon.

The *British Medical Journal* of May 7, 1921, in an editorial states that at 5.49 P.M. on Saturday, May 5, 1821, the Great Napoleon died at Longwood, St. Helena, an exile and a prisoner: "The last single captive to millions in war." A hundred years have elapsed since that event took place, and the whole of Western Civilization is uniting to do homage to that great name. For many years now the memory of Napoleon has been occupying a continually increasing share of the thoughts of mankind, and in latter times the mists of prejudice have in large measure been cleared away, leaving the historic figure of Napoleon in truer perspective and enabling us to make a juster estimate of his mission in the world. This week the press is being deluged with appreciations, analyses, and critical reviews, and perhaps from them all will emerge some definite conception of the real Napoleon. What is the secret of the hold this man has upon the human imagination? Dare we attempt a solution of the problem?

The eighteenth century was occupied mainly in freeing itself from the last strangle-hold of the feudal system of civilization, and the weapon used was the spirit of free inquiry. Under repeated assaults this system, which had long outlived its usefulness, which for centuries had held the human race in bondage, which had established for its own security the idea of hereditary power, and which demanded a blind belief in certain principles necessary for its existence, began to sway and totter.

Voltaire convinced mankind that it should suffer no penalty for thinking as it pleased, and Rousseau insisted that all men were born free and equal. The wide acceptance of these principles sounded the death-knell of feudalism, and in 1789 it fell with a resounding crash. The old order was swept away, the old slavish adherence to so-called "authority" was gone; and men were told that all were free and equal, were to serve no master and to worship no god. The pendulum had swung to the farthest point from servitude, and it was about to move again in obedience to the immutable law. The time had arrived, and the man, in the person of Napoleon.

He came without a name, without a country, educated on the charity of France, devoid of rank and fortune, but possessing the most amazing efficiency of brain that the world has ever seen. Cold, collected, and unerring in thought, "steady as bronze, quick as lightning." Not cruel, but merciless to anything that stood in the way of the attainment of his wishes, the very embodiment of the new world, which cared not for right, which demanded only efficiency. And so France followed Napoleon, each man carrying in his knapsack a marshal's baton, and cheerfully giving him servitude in return for the career open to ability. Rank and birth did not count. What wonder Napoleon became master of the world and that among his followers there could be found, in the person of a common postillion of a country inn, the most fearless cavalry officer the world had ever seen, and one judged fit to be a king! Everything was possible.

Napoleon possessed in a superlative degree all the qualities coveted by the ordinary man of the world, and in that sense is truly a representative man. He was also thoroughly representative of the modern system, as opposed to the ancient on which Europe had existed for many centuries. He was the head of a galloping, breathless age intoxicated with a newly found freedom, where the meanest born might become powerful did he only possess brain efficiency. To science he was ever

ready to give a helping hand, firmly convinced as he was that the progress of science meant the advancement of the state. Chemistry in particular he fostered, because he realized that it was the foundation of industries useful to the community. His mathematical mind could not accept a science so inexact as medicine, and he was prone to belittle the efforts of the physician, but he would have understood and applied the recent achievements of preventive medicine, and he has left on record a noble appreciation of the work of the great surgeon Larrey, designated by him the most honest man he had ever met.

Much has been said about Napoleon's attitude toward democracy, and attempts have been made to read into his life a tendency in that direction. But how could it be so? Napoleon was individualistic to the core, and although the community might benefit in the long run, the prime motive was always personal advancement. His success was phenomenal and failure seemed a remote possibility. He was a dazzling military genius, a mighty law-giver, a far-seeing and consummate statesman, endowed with greater powers of intellect and endurance than had ever been given to man; then came the crash of Waterloo and the agony of St. Helena. Did any man ever climb to such giddy heights and then fall so far? What is left of the Napoleonic system? Military despotism, always questionable, has received its death-blow after our experience of the late war. Napoleon's European system has long since been rejected. Only the mighty "Code Napoleon" founded on the principles of equity remains. But the personality of Napoleon will hold its sway over the world forever. As Emerson has said, "We are all little Napoleons," and whenever we think in terms of brain efficiency, unconsciously we have in mind Napoleon, the greatest example of "braininess," who came from nothing and who gained everything by sheer force of intellect. That is why, as Alison has said, "Napoleon will live when Paris is in ruins; his deeds will survive the Dome of the Invalides."

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The Use and Proper Dose of Digitaline

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In presenting for consideration clinical facts which years of experience have proven, it is necessary to demonstrate truths that are irrefutable, even though conventional opinion be largely antagonistic.

In studying that derivative or active principle on which the specific therapeutic effects of digitalis depend, we are confronted with the fact that the name "Digitaline" is applied to several of its contained glucosides, each one of which possesses distinct chemical and physiological properties and, so far as molecular formulæ obtain, constitutes a totally different substance. It is true that from a therapeutic point of view their actions are similar in certain particulars, but nevertheless associated with varied and different physiologic power. Thus there is Digitaline Kiliani, Digitaline Belgique, Digitaline Chloroformique, Digitaline Verum, Digitaline Nativelle, and Digitaline Germanicum Merck.

It is of the latter, and to it *only*, that the following statements apply.

Another fact of great importance, and possessing clinical significance, is the recommended and conventionally established dose of digitaline. For digitaline Nativelle it varies from 1/600 grain to 1/200 grain, and for the other so-called "digitalines" anywhere from 1/100 to 1/60 grain.

The result of this wide variation of dosage, and the confusion occasioned because of the absence of differentiation of the digitalines, manifests itself by an ignorance of their physiological effects, the consequence of which is that digitaline, so called, is regarded as variable, unreliable, even worse than useless, and not to be compared in therapeutic value with the galenical or official digitalis preparations.

In conversation with one of the world's acknowledged highest authorities as a cardiologist, the assertion was made that "digitaline" was found to be useless in his experience, and to emphasize such belief he asserted that the 1/32 grain of digitaline (which, not stated) hypodermically was administered without demonstrable result! Of course such an inadequate dose could not but fail to effect a demonstrable physiologic influence.

Seemingly it appears that no thought was accorded the fact that that dose, even though much larger than is conventionally taught and recommended, might have been, by careful and intelligent increase, proven utterly inadequate for effecting any physiological reaction, and that adequate dosage would result in positive and favorable reactions as certainly as those following proper doses of morphina, strychnina, atropina, etc., are well known to do.

What would have become of these latter medicaments if similar ignorance and practice had characterized their administrations?

A comparative study of the physiological action of the derivative under consideration with the various digitalis galenicals demonstrated another fact, to wit: in order to secure with certainty restoration of circulatory equilibrium, which, because of one or more of a variety of cardiac and vessel lesions, was seriously impaired or lost, the galenicals required doses that would cause distressing gastric and even gastrointestinal disturbances, and, *per contra*, that with doses essential for the same end digitaline Germanicum Merck in gr. $\frac{1}{4}$ three or four times daily as an average rule proved successful with absence of this distress, or at most with an insignificant degree of discomfort.

Recently, literature is beginning to recommend a departure from the long prevalent belief that galenical digitalis should be given in doses of from five to eight minims of the tincture; a grain of the leaves, and the adoption of doses of the tincture varying from f3ij to f3iij and even f3iv, according to particular methods of reestablishing circulatory equilibrium.

Laboratory study has proven that the principle referred to was equivalent in $\frac{1}{4}$ grain dose to 15 minims of a standardized tincture. Consider, therefore, how such inadequate doses of digitaline Germanicum Merck as 1/100 of a grain, or even the 1/32 grain above mentioned, would utterly fail to demonstrate its therapeutic value. Years of clinical test have shown that this active principle practically represents the total equivalent or therapeutic activity of the crude drug, and differs from the latter

in being almost entirely free from those associated properties which in full doses provoke gastrointestinal distress.

Bearing in mind, then, that digitaline Germanicum Merck in $\frac{1}{4}$ -grain dose is the equivalent of fifteen minims of standardized tincture, it becomes self-evident that to obtain with certainty "digitalis effects" $\frac{1}{4}$ -grain doses must be administered.

Again, as this derivative possesses relatively little tendency to induce gastric disorder, and is as certain in action as any known active principle of the entire materia medica, the conclusion is inevitable that for the best results of digitalis therapy it constitutes the weapon of choice.

It is not the province of these remarks to detail the conditions indicating digitalis therapy, but it may be stated that it is serviceable in all lesions for which digitalis is commonly employed. It possesses the great and superior advantage of uniformity of physiological power, which galenical digitalis does not. It can therefore be confidently relied upon, and in adequate doses, other things equal, *never fails to effect the desired results!* In emergency its hypodermic administration in from $\frac{1}{2}$ to 1 grain doses diluted in from 10 to 20 Cc. normal salt solution will establish reaction in from twenty minutes to half an hour. Its powerful vasoconstrictor action will cause cellulitis and even abscess, if it be not well diluted when given hypodermically. Its use intravenously has not been attempted, and because of the promptness with which it acts subcutaneously, the involved risks render it advisable to not so employ it. During many years of continued administration the much-dreaded cumulative action has not once been encountered.



Critical Comment on Current Methods of Public Education in Venereal Disease¹

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This meeting serves to emphasize the fact that the importance of hygiene, sanitary science, public health, preventive medicine, or whatever one chooses to call it, is coming to be more properly appreciated. The matter of sex hygiene (and this includes consideration of the question of certain diseases associated with the genito-urinary system) is but a part, but nevertheless a very important part, of this larger field.

The first requisite of a public health movement which attempts to control these diseases is candor; we must "call a spade a spade." So let us make our start by speaking of syphilis and gonorrhea rather than of the "venereal" diseases, the "social" diseases, or "the social evil," although in addition to these two we recognize chancroid and gangrenous balanitis as coming under this classification; these latter are for the most part comparatively rare, generally localized and self-limited, while syphilis is a generalized infection, often congenital, indirectly or directly causing perhaps ten per cent of our total mortality and an immeasurable amount of morbidity; and gonorrhea is a chief cause for sterility, also responsible for the greater part of abdominal surgical operations in the female. Let us be specific and direct in our statements. Another objection which I have to the much hackneyed term "venereal," besides the fact that it clouds the issue, is that not all of these diseases are contracted in venery. When by reason of our terminology we imply just this, it is not correct and does not include ophthalmia neonatorum, congenital lues, vulvovaginitis, syphilis contracted by the common use of pipes, razors, and the like. Let us also realize that any of these

manifestations are as truly syphilis and gonorrhea as when those diseases are contracted during sexual congress. This is a most important point, for if we can but get the public to realize that sometimes syphilis and gonorrhea are innocently contracted, it will not only make them more charitable in their attitude, but it may go far toward removing the odium which surrounds these conditions in the public mind to-day.

Those investigators who are interested primarily in preventive measures will realize that the real problem before us, the one which offers the possibility of the greatest return on the investment, is the one directed toward the control of syphilis and gonorrhea and does not concern itself actively with the other two above mentioned diseases (chancroid and gangrenous balanitis), in which the mortality is practically *nil* and in which for the most part there is no effect on the next generation. Let us see clearly that this is the real issue. A comparison here may be of some value. Had the city of Pittsburgh some years ago passed ordinances with regard to detection and isolation of typhoid carriers, milk examinations, and the like, and spent its money enforcing these, it is safe to say that their typhoid rate would scarcely have been affected; instead they built a slow-sand-filtration plant for the treatment of their water supply, and now typhoid fever is so rare in Pittsburgh that one can scarcely find a case at the hospitals for teaching purposes, and when such a case is located and its history learned it is generally found to have been imported. This is an excellent example of the relative value of different procedures in a public health programme, and the method of meeting any specific set of conditions is the most diffi-

¹ Prepared for the Institute on Venereal Diseases held by the U. S. P. H. S. at Washington, D. C., November, 1920.

cult problem for the novice; for he lacks the training necessary for nice judgment as to relative returns to be expected from various activities.

This is real preventive medicine—that is to say, the emphasis is placed just where it belongs. The old saying “An ounce of prevention is worth a pound of cure” is just as true now as ever it was, so instead of bending our efforts to “close the barn door after the colt is out,” let us close it before, for this latter is distinctly less work, as we don’t have to chase the colt. Let us place more emphasis on prevention and less on possible cure, for with a ratio of at least the proverbial sixteen to one, the end result will be a much happier world. As an illustration of just what I mean: A short time since I reported to a trained bacteriologist that both bacteriological examination and sanitary survey showed a certain water-supply to be potentially dangerous. His reply was in the form of a query as to whether or not the supply in question had yet caused a typhoid outbreak. This is not the spirit of modern sanitary science.

You know well some of the other great achievements in the field of preventive medicine, such as malaria control, yellow fever suppression, and the like, and while the control of gonorrhea and syphilis is somewhat analogous, it is much more difficult, though the difficulties are by no means insurmountable. In typhoid fever, yellow fever, and malaria the vicious cycle of the disease may be broken by controlling a certain element in the environment; for example, in typhoid fever this element is the water and milk supplies (chiefly), in yellow fever and malaria the element easily controlled is the mosquito and its breeding place. Gonorrhea and syphilis, like the diseases enumerated above, are specific communicable diseases, but the chief method of infection is through personal contact—fomites, carriage by the lower animals, and other indirect means of conveyance playing a very minor rôle; and as is readily seen there is no intermediate part of the

vicious cycle, in which the causative agent is in the environment, offering to the sanitarian an easy point of attack in order to check its dissemination.

In malaria, yellow fever, and typhoid fever it is only necessary to educate the executives of a community in the problem of control (we could almost use the term eradication when referring to these diseases), and when the issue has been clarified to these few individuals, the proper methods can be instituted and the public becomes educated by having the results forced upon them. In gonorrhea and syphilis, on the other hand, it will be necessary to educate the majority of the people in a community before obtaining any great results; to mold public opinion before all the proper steps can be instituted; for here the individual himself or herself is the dangerous element to the community.

As above stated, there is no means of controlling the spread of syphilis and gonorrhea through interrupting their dissemination by a control of some environmental factor, for these diseases are spread through intimate contact. We cannot, therefore, by education of a few members of the community institute adequate preventive measures as we can in typhoid fever, yellow fever, or malaria. Another difficulty in the attack upon these diseases is our present idea of morality—those moral or immoral principles which in their present-day application account for approximately ninety per cent of all the blindness in both eyes and seventy per cent of all abdominal operations on females, not to mention the percentages of individuals in our insane asylums due to congenital or acquired syphilis, and those others the victims of angina pectoris, aneurism, tabes, and the long list of other manifestations of the spirochæte. Still another difficulty which we must face at once is the generally accepted double standard of morality, and in any course of lectures the absurdity of such an attitude should be clearly pointed out.

We must not, however, be too pessimistic, for “while the mills of God grind slowly,

they grind exceeding small." A decade ago to have mentioned syphilis or gonorrhea in a mixed audience would have been to be branded as a social outcast; to-day we may speak without reserve to such selected audiences as this—a fact which denotes progress; but we are still very far from the millennium, and for the most part the general public would rather hide its head like the foolish ostrich, when these diseases are mentioned, than face the issue, which later is forced upon them when they pay the penalties enumerated above.

In all dealings with the sex impulse, it must ever be kept in mind that it is a primitive, instinctive appetite; like hunger or thirst, but different in that it becomes more prominent at adolescence and wanes after middle life, whereas the other two are present while life exists. The effect of national prohibition should be recalled here—alcohol, which is always a depressant, has been an important factor in the past in the spread of syphilis and gonorrhea. Its depressing effect is first evident on the higher cerebral centers, with a resulting loss of the normal moral tone and consequent exposure.

How then are we to approach this subject? Will an appeal to morals or to fear help? Only a very limited few will be reached by this method—we have been doing this since the era of Christianity, but with no visible effect on the problem. But the churches and ministers can help, if into their curriculum of study for young men preparing for the ministry they will include a good course in sex hygiene which the minister on graduating is capable of presenting to the boys and men of his church. This question of morals is a very curious one. Last year in Pittsburgh such films as "Fit to Fight" and the "End of the Road" were suppressed, but we were allowed to have our full quota of "vampire" films.

This illustrates very definitely that ignorance of the importance of this subject is not confined alone to the masses, and shows a real need for education among

certain of those who hold this important means of molding public opinion—*e.g.*, our moving-picture censors, for the motion picture is a wonderful means of education when properly employed. This reaction is not alone the property of certain moving-picture censors; it is found in our State Boards of Education in their attitude toward the introduction of sex hygiene into our secondary schools and in many other positions of responsibility, where, judging by the position alone one would suspect the incumbent to be properly oriented toward this matter, which is of the most vital importance to the whole nation.

Can parents help in this matter of education? They have done little in the past, perhaps because they did not possess a vocabulary to express themselves comfortably. Would it be a success if we tried now to educate the parents? Probably, the task of reaching them by lectures is too great, and they cannot be depended upon to read and correctly interpret proper literature put into their hands. The family physician, when informed on the subject, is also probably too busy for the task. Would extension lectures, regularly advertised, be of any value? I doubt very much if a speaker could get a sufficient audience to warrant the effort, much less reach a majority of any given community. What about noon-day lectures to factory hands? Some slight results might be obtained this way, but the time is very short for the development of such a subject. Circulars in the pay envelopes are, too, a very uncertain method, but probably will do no harm.

What shall we do with the prostitute, either male or female? We must not pass over this question too rapidly; prostitution has always existed, and one would be very optimistic to think it might be eradicated. To a certain extent the commercial prostitute may be controlled, but it seems reasonable to suppose that among the clandestine prostitutes disease incidence is probably higher. This is a very vexing question, and I would only point out in passing that when we say prostitute we must think of

others besides the commercial individual and must have our legislation and enforcement far-reaching enough to include this other class. It must be remembered, too, that if we take the commercial prostitute from her accustomed haunts we must see to it that she has some trade or occupation whereby she can earn her livelihood, for many prostitutes are undeveloped mentally. Mere placement in a new environment is not sufficient, and they should be closely followed by our social agencies.

If we were not previously convinced that education never harmed any one, the results obtained by the effort of the U. S. government to make our army fit during the world war would clinch the matter. True, the task was entered into for purely selfish reasons (to produce an efficient body of men), but if it is worth while in time of war, why not in times of peace?—and the government's programme was one of intensive education: lectures, quizzes, lantern slides, moving-pictures, everything to get the message across. And then for the keystone of the arch, prophylactic stations were established for treatment when necessary. It would seem as though this tried and successful method would be the most promising procedure, and it can be applied gradually to any community. We should adopt this programme—for the establishment of prophylactic stations offers no particular difficulty, and the advantage of their use would soon be apparent even to an apathetic public; but the method of education does, simply because people are not yet advanced enough to realize the value of such information. Every possible method should be used to educate the general public, particularly the younger generation, and at the same time executives in educational work should have the matter of including such courses in their curricula brought clearly to their attention.

With but a limited amount of money available for an educational programme it should be remembered that the difficulty of reaching the adults in the population is much greater than that of reaching the

younger set. The latter can often be reached in large groups in schools and various other organizations. The adults have their habits fairly well crystallized, and any attempt to reach them is palliative rather than preventive. Let us educate the educators and others who are leaders in the formation of public opinion and by this means reach the present younger generation. Our programme is one which should look many years to the future for any appreciable decrease in these diseases, so we should not be discouraged if early efforts are not particularly successful. Persons trained in preventive hygiene realize the truth of this latter statement, and it should be impressed upon those other workers in the field who have no such training but whose splendid enthusiasm makes them very valuable, in order that they will not lose their courage if early attempts are not signally fruitful. The difficulties which beset the road are legion, and the only way advance can be made is by steady, scientific, rational measures—we must keep "pegging away."

In high schools they generally teach a smattering of the physiology of the circulation and perhaps of respiration, but this, the most important of all, the physiology of reproduction, is tabooed. I know of only one high school in which this subject is claimed to be properly taught, and perhaps it is just as well, for it is work for an expert in this particular field. And when I say an expert I mean a good teacher, interested in the subject he is teaching, but one who possesses more than the interest of the layman, and while I admit never having had any pedagogy (and perhaps I am the better for it) I feel that it will not be out of place to give some personal ideas on the necessary qualifications of a teacher in this particular subject (though they may be of more general application).

First of all, he must have had extensive training himself along biological and medical lines—this is fundamental, and if you think it an unnecessary statement look at the training (or rather lack of it) that most

of our teachers in hygiene, particularly in the secondary schools, have had. To this should be added, if possible, some expert or consulting work in the field chosen so that the teacher will not grow stale but keep up with the procession of ideas in the world. In hygiene, more than in any other field of educational endeavor, are we less willing to recognize the "authority" who is without training and whom we might refer to as a mental Topsy—who "just grew." Training, preferably in sanitary science and preventive medicine, is an absolute prerequisite.

Secondly, the teacher must speak in simple language easily understood by the students—he must project himself back to the position where he was when he was his students' age; in other words, he must always realize that he is not addressing a group of experts in his particular field. The teacher is not necessarily an orator, perhaps it is better if he is not, but he should be able to present facts clearly and concisely.

Thirdly, the teacher must be sincere and enthusiastic. Unless he possesses all three of these fundamentals his course will be a failure and he will have wasted the time of his students, which time is regarded altogether too lightly in many schools. If the course is not successful, examine it carefully from the standpoint of the three requirements given above. You will be surprised how often the failure is due to the non-recognition of the first one named, and yet one would expect but little from a teacher in any other field if he had had no fundamental training. And let me caution you that a course just labeled "Hygiene" will not fill the bill; it must have the proper content. I have known of such courses which were largely drivel on physiology, climatology, or dietetics, and do recall here that the waste of the student's time in taking such a course, while important, is the least important factor, for not only has his time been wasted, but most noteworthy of all, a subject of relatively no importance

has displaced information of the greatest import, and the student is without the knowledge to which the time of the course was dedicated.

I believe that it is possible to attack the problem in the last years of the high school curriculum (if we can provide proper teachers), and most assuredly it can be handled in our institutions of higher learning where hygiene is included (and if it is not taught it should be, and that properly). Of course, each sex should be separately taught and the instructor should be of the same sex as the class. Think what a terrible reproach it was at Panama when some of those examined were told they had syphilis, gonorrhea, or both, and they replied that they did not know such disease existed! Would this not be a most terrible reproach on any of our institutions of learning? And yet the possibility exists! I wish I had time to detail to you the results of a survey made by me about three years ago relative to the teaching of hygiene in our colleges. This teaching need not be confined to the schools—organizations about churches, boy and girl scout troops, and the like offer a fertile field for the dissemination of proper hygienic information. If rightly approached it is not difficult to interest students in a scientific exposition of sex hygiene. I shall be very glad to give you one of these mimeographed copies of the outline of the course in Public Hygiene which I am giving at the Carnegie Institute of Technology. It represents an attempted biological approach to this subject, and appeals to the pride of the student from the standpoint that inasmuch as he is being trained to become a leader in his community, so he must be a pioneer in this—I do not hesitate to call the most important subject in the world to-day.

And while we are helping to form public opinion on this subject, let those of us who occupy the unimportant places in the world not be discouraged. Remember that "They also serve who only stand and wait."

Random Notes on Treatment

(A Second Paper)

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I. *Treatment of Meningeal Phenomena in Apical Pneumonia.*

Although absolute expectation in pneumonia has its good side, and although all untimely medication is to be avoided, one must, on the contrary, act energetically as soon as these patients develop meningeal symptoms. In these circumstances the treatment of the pneumonia is of less import—although it must not be overlooked—than the general state of infection of the patient. Hutinel believes in interference—and in this we agree—even when the nature of the inflammatory meningeal process is not established. The notions that have been acquired as to the part played by toxins in general show the necessity of favoring the elimination of these products by way of the natural emunctories and especially by the kidneys.

When once intoxicated, the nervous system can no longer play its important part of regulator of the organic defences; the centers are compressed by congestion and their normal functions are interfered with; therefore, decompression should be made in order to relieve the patient. Hence, two excellent therapeutic means — *baths* and *lumbar puncture*.

The French observers, especially Auffercht and Netter, have insisted upon the good results obtained in these cases by hot baths at the temperature of 38° C. (100.5° F.) to 40° C. (104° F.), lasting for ten to twelve minutes, and repeated every three to four hours. A tepid sinapized bath also produces good effects in children. Briefly stated, baths possess an action in the nervous centers whose essence escapes us, but the reality of which is affirmed by the immediate results obtained.

Lumbar puncture, employed for decompressing the nervous centers, is not always exempt from danger, but nevertheless it may rapidly produce favorable effects, and for this reason it should be resorted to. Puncture will cause coma to disappear, and usually it causes headache to subside and, therefore, instantaneously relieves the patient. But since the cerebrospinal fluid is rapidly reproduced, puncture may have to be repeated once or several times.

Local decompression may be obtained by the application of cold compresses, frequently renewed, on the patient's head, and personally I think that these give more decided relief than the ice-bag. Local bleeding—leeches behind the ears—intestinal derivation by a purgative enema, cutaneous revulsion with mustard or dry cupping on the limbs, neck or trunk, and wet packs, are all old, well-tried procedures that give excellent results and are far too much neglected by the younger members of the profession, who rely upon the chemist for devising products usually unreliable when applied in practice. And here let me say that in the cases under consideration it is more prudent to abstain from the use of hypnotics, such as chloral, opium, or the bromides.

Injectations of salines in children is likewise a rational procedure as it raises the pulse and relieves the adynamia, while diuresis is assured. However, saline injections are to be resorted to with reserve, and some observers, especially Loeper and Laubry, are adverse to the method.

So much for medical treatment in the strict sense of the term. Other observers of more daring temperament have resorted to quite special measures, especially in

purulent meningitis. Paget has drained the cord both for obtaining decompression and for the elimination of the bacteria and their toxins. Others have drained the cranial cavity in the parietal region. Corvé and Bambilla have injected a solution of sublimate into the subarachnoid space, while with the object of rendering the pus more fluid, Kroenig injects a saline solution into the medullary cavity. It is hardly necessary to add that the two latter procedures will scarcely find adepts among rational physicians, not to say surgeons.

Spinal injections of collargol are really efficient in some cases, but to my mind it should only be given in intravenous injections. These are devoid of danger.

II. *The Treatment of Scarlatina and Its Complications.*

I am firmly convinced that the milk diet in this disease should be discarded and that the achloride diet should be substituted, as renal complications are less liable to occur with a saltless regimen, and on the whole convalescence is more rapid. An exclusive milk diet weakens the patient so that recovery is longer in taking place, and it does not prevent the development of nephritis as has been generally supposed.

It is all-important to carry out rigorous antisepsis of the skin, pharynx, and nasal fossæ. In the first place, keep the patient strictly in bed in a room moderately warm in winter in order to avoid chilling, which unquestionably has much to do with the development of complications. Each day a soap-and-water bath at the body temperature should be given in order to keep the cutaneous surface clean and to remove the squamæ. After the bath rub the entire body with a good quality of cologne-water—it is an excellent hygienic measure.

The pharynx should be swabbed three times daily with the following when the angina is mild:

℞ Resorcinol, 2 grammes;
Glycerini, 30 Cc.

When the angina is severe and false

membrane is present the following is excellent:

℞ Menthol, 10 grammes;
Pulv. camphor, 5 grammes;
Ol. olivæ, 30 Cc.

In adults a gargle with freshly prepared 5 per cent Labarraque's solution is effective. This is, as is known, a solution of sodium hypochlorite and is of unquestionable value as an antiseptic. In children who are unable to gargle, the mouth should be swabbed out with these solutions. The gargle or swabbing should be repeated seven or eight times in twenty-four hours. The teeth should also be brushed after taking food.

Before or after each pharyngeal application a teaspoonful of the following should be allowed to run into each nostril:

℞ Pulv. camphor, 15 centigrammes;
Menthol, 30 centigrammes;
Resorcinol, 2 centigrammes;
Ol. olivæ, 50 Cc.

As to the diet, it should be liquid, composed of soup with macaroni, and cream with eggs, as long as tumefaction of the tonsils renders swallowing painful; but as soon as the angina has subsided commence with solid food, such as fish, dry or fresh vegetables in purée, vermicelli, preserves, eggs, fat, bread—all without salt. For drinks give freely of diuretic decoctions, such as dog-grass, cherry-stems—very effective—and uva ursi, to which some syrup may be added, while Evian water is equally good on account of its low content in sodium chloride.

A daily examination of the urine should invariably be made, and if albuminuria appears, limit the nitrogenous foods and increase the carbohydrates. The bowels should be kept open by mild laxatives. A soup-spoonful of castor oil or a formula containing magnesium should be given at least once a week. Attention to the skin, mouth, pharynx, and nasal fossæ should be carried out carefully for not less than three weeks. By this means suppurating otitis media may be avoided, but should any symptoms pointing to this serious complication arise active treatment must be instituted at once.

As soon as the first symptoms develop, namely, violent otalgia, deafness, tinnitus aurium, etc., a sedative and antiseptic treatment must be maintained until the diagnosis of pus in the middle ear has been made. Then the tympanum must be incised. Morning and evening instil the following after warming in hot water:

℞ Phenolis (C. P.), 30 centigrammes;
Morphinæ hydrochlor., 5 centigrammes;
Glycerini, 15 Cc.

Disinfect the nasopharynx with the following gargle:

℞ Resorcinol, 3 grammes;
Aq. dest., 300 Cc.

And with a nasal ointment as follows:

℞ Eucalyptol,
Resorcinol, aa 30 centigrammes;
Vasellini, 30 grammes.

In nurslings and young infants carbolic acid should not be used. Interfere surgically as soon as possible in order to avoid extension of the process to the mastoid cells, as well as delay in recovery. Make a large incision in order to give exit to all the pus, after which inflation, or Valsalva's method, should be done to force out the pus from the cavity of the tympanum. For the three or four days following the auditory canal should be washed out with 1:8 volumes of hydrogen peroxide. When suppuration decreases instil a 4-per-cent resorcinol-glycerin solution at night and irrigate in the morning with Dakin's solution. Should a periauricular dermatitis develop due to irritation from pus, the following may be used:

℞ Zinci oxid., 3 grammes;
Resorcinol, 30 centigrammes;
Vasellini, 15 grammes.

When convalescence from the scarlatina is well established the patient may be allowed to sit up for a few hours each day, but not before the end of the third week from the onset of the disease. The daily baths are to be continued until the thirtieth day.

As to the treatment of acute postscarlatinal or postinfectious acute nephritis, it is the same as the scarlatina itself in so far as the chloride-free diet is concerned. Milk is

no more indicated in nephritis than in scarlet fever, and should be replaced by diuretic decoctions and Evian water.

According to the particular indications presented by the development of certain other complications, additional therapeutic measures may be used. Thus bleeding, wet or dry cupping over the lumbar region, puncture of a hydrothorax, bilateral or not, interfering with respiration, or removal of ascitic fluid when too abundant, will sometimes be required. Should the heart become weak, subcutaneous injection of 20-per-cent camphorated oil is about the best of all remedies.

III. *The Treatment of Pulmonary Gangrene in Children.*

Hygienic measures such as are to-day carried out in rooms and hospital wards are the basis of prophylaxis of pulmonary gangrene. Otitis, so common in children, must be carefully treated in order to prevent embolic pulmonary gangrene from occurring. The same applies to bronchiectasis and acute or chronic gastroenteritis. This said, how shall we treat a patient when pulmonary gangrene has developed?

First, there is medical treatment. (1) The patient's strength must be maintained; (2) attempt to disinfect the pulmonary focus; and (3) combat the predominating symptoms. Let me say, however, that in children the diagnosis of pulmonary gangrene is difficult and is frequently not made, perhaps in not more than 33 per cent of the cases, because the two most important symptoms—fetid breath and expectoration—are absent in about 66 per cent of the cases in children.

The patient should be kept in bed in a large, well-aired room. A nourishing diet of milk, eggs and raw meat is essential. Wine, brandy, iron, and cinchona are indicated.

Inhalations of creosote vapor have been known to be beneficial. The cough and high temperature are to be controlled by opiates, salicylic acid, and quinine.

In the fuso-spirillary form of gangrene

novarsenobenzol can be given intravenously in progressively increasing doses—fifteen to sixty centigrammes—every fifth day, and it would appear that hemoptysis and albuminuria are not contraindications to the use of this treatment. But the most recent medical treatment is that advised by Dujour and Semelaigné, which consists of injections of Weinberg's antigangrenous serum, which was used with success during the war in gas gangrene. As this treatment has just been published, I would refer the reader to the original source which appeared in the *Bulletin de la Société médicale des Hôpitaux de Paris*, Jan. 11, 1920.

Surgical treatment consists in making an artificial pneumothorax, and since the reason is obvious I need not go into details. Suffice it to say that it has given excellent results and is to be thoroughly recommended. In the pleural form of pulmonary gangrene, pleurotomy and serotherapy are the only proper therapeutic methods.

If surgical treatment of the pulmonary gangrenous focus is indicated by the severity of the symptoms and as a life-saving measure, it must be undertaken at a very early date in the process. It is formally indicated in every case of pulmonary gangrene in which there is a single, extensive but distinctly limited focus, with a serious general state and a menace of septicemia.

Large incisions should be made into the focus in order to thoroughly empty it and to remove the strips of parenchymatous slough. A large thoracotomy, with resection of the ribs in proportion to the extent and depth of the gangrenous focus, should be done. The pulmonary incision should be made with the thermocautery and the focus freely exposed at a point, and after it has been thoroughly inspected by both sight and touch, the cavity having been cleaned out, it is packed and drained.

Unfortunately, in children the gangrene usually exists in multiple foci in both lungs, so that surgical interference is not very often indicated. I might, perhaps, put it according to personal experience as about one case in six.

IV. *The Treatment of Catarrhal Icterus.*

Among the various forms of icterus should be distinguished: (1) *Lithiamic icterus*, nearly always preceded by pain characteristic of biliary colic; (2) *acute alithiamic icterus*, which may offer the following modalities: benign catarrhal icterus, the expression of some mild infection: serio-infectious icterus, clinically mild; and serious toxic icterus. I would simply recall syphilitic icterus or, more properly speaking, the jaundice following the intravenous exhibition of the new arsenical products.

In the case of catarrhal icterus, the intoxication from the digestive tract should be dealt with by both diet and medication. An absolute milk diet is indicated when there is marked loss of appetite. The milk should be diluted with Vichy or Vals water, and should have the cream removed when possible. If the appetite is preserved, a vegetable diet with macaroni, fresh vegetables, etc., should be ordered. As soon as the stools are again colored the usual diet may be begun again, but with all due caution.

Medication strictly speaking consists of the exhibition of purgatives, cholagogues, and enemata. Sodium sulphate, sodium and potassium tartrate are preparations frequently prescribed. They can be given in different ways either in small doses, two to four grammes, in a glass of tepid Vichy water every morning for several days, in which case they act as cholagogues, or they may be given in laxative doses, six to eight grammes, or in purgative doses of fifteen to thirty grammes.

Benzoate of sodium and sodium salicylate are very frequently utilized, alone or combined. They act as disinfectants and cholagogues, but the salicylate must not be given if any renal lesion exists. Formin is also a good remedy in the dose of one to two and a half grammes in twenty-four hours, while calomel as a diuretic and intestinal antiseptic has its indications, but one should be careful of this drug as it may cause violent colic in certain patients or even provoke

phenomena of intoxication. Podophyllin, euonymin and ox-gall may be prescribed, a good formula being:

℞ Res. podophyllin, 2 milligrammes;
Fel bovis inspissat., 25 centigrammes.

In capsul. No. 1.

D. tal. dos. No. L.

S.: One capsule after each meal but not more than four a day.

Daily cold enemata give good results. They cleanse the bowel, activate its contractions, and empty the gall-bladder by reflex action; they consequently control the habitual constipation present in jaundice. They should be given at a temperature of 18° C. (65° F.) to 20° C. (68° F.) and are to be retained for five minutes, during which time a light massage over the liver is done.

Pruritus is a very disagreeable phenomenon in icterus. It should be dealt with by general warm hydrotherapy, hot alkaline baths, lotions, and powders. A soup-ful of camphorated alcohol to one liter of water makes a good lotion, or a 2-per-cent chloral solution may be used.

After the lotion the parts are powdered with:

℞ Talcum, 100 grammes;
Menthol, 50 centigrammes.

Or the cutaneous surface may be painted with:

℞ Glycerini, 60 Cc.;
Chloroformi, 20 Cc.

V. *The Treatment of Fistulæ of the Neck of Dental Origin.*

Fistulæ in the neck arising from some dental lesion are most commonly the result of a periodontitis, which is the initial phase of every dental abscess. Those due to alveolar necrosis or that of the jaw itself, such as that met with following the eruption of a wisdom-tooth, although seeming to be due to alveolar necrosis or necrosis of the maxillary bone, are in reality due to a periodontitis, the primary and fundamental process without which no necrosis can occur.

Fistulæ of dental origin can be divided into direct or communicating odontopathic

and adeno-odontopathic fistulæ. The symptoms are both general and local, and among the latter the principal ones are necrosis of the tooth, its color, insensibility to pain, and opacity. The diagnosis must be made from congenital sinuses, fistulæ due to cervicofacial actinomycosis, tuberculous adenitis, syphilitic osteitis, and abscess of the neck. The diagnosis of direct odontopathic varieties may present some little difficulty. Every tooth not carious which gives rise to an abscess should be treated without delay. The treatment of fistulæ will vary according to the dental lesion or those of the jaw giving rise to them.

First of all let it be said that the treatment of a tooth the source of a sinus, if the former be in relatively good condition, will probably be of little avail, although it will be for the dentist to decide. Extraction of a tooth should never be attempted if it can be avoided, but when it acts like a foreign body and irritates the jaw, it must be removed. When a fistula exists in a child, the jaw being still undeveloped, the molars can be extracted because the evolution of the maxilla and teeth, especially the wisdom-teeth, will help in filling up the gap left by the extracted molar. It is essential for the physician to ascertain for himself that all sequestra have been removed, because should any remain the sinus cannot be made to close.

Buccal antisepsis must be obtained, and for this gargles with a 3-per-cent potassium chlorate or one of the following should be used:

℞ Thymol, 2 grammes;
Alcohol, 90°, 50 Cc.;
Aq. dest., q. s. ad 200 Cc.

Or a decoction of marshmallow will be found very soothing if there be still come buccal inflammation. Twenty grammes of the root should be boiled in 300 Cc. of water and continued until this is evaporated to 250 Cc., and then to this is added 750 Cc. of a 3-per-cent boracic acid solution. This is used as a gargle every hour or so.

Every other day a 3-per-cent solution of zinc chloride should be slowly injected into the fistula in order to provoke hyperactivity

of the healthy cells and at the same time to destroy the morbid tissue. If the case is seen early in its evolution and the tooth has been removed, the abscess will not open on the neck or cheek, but an internal blind sinus will be found in the alveolar ridge opening into the buccal cavity. The treatment is to wash out the alveola with antiseptic solutions with a small syringe, and the patient should gargle several times a day with a hydrogen peroxide solution not stronger than four or five volumes, or a 3-per-cent salicylic acid solution.

When all the buccal and maxillary symptoms have subsided the sinus conditions must be dealt with. In practice the point we should aim at is that after cure of the sinus the site of its orifice in the neck shall not be seen, but fistulæ in the neck of dental origin almost invariably result in very unsightly cicatrices. This is due to the fact that the repair in the depths of the tissues often goes on irregularly, and in order that a cicatrix shall be homogeneous, elastic, and without adhesions, it is essential that the granulation tissue shall develop evenly at all parts at the same time, and that union shall take place from the bottom toward the surface.

When the track of the sinus escapes all direct regulating interference on account of the small dimensions of its caliber or from a very sinuous course, the usual treatment is to push in a gauze wick. This is a blind and a slovenly method, and will fail, but unfortunately this is frequently done, much to the patient's disgust and discredit to the physician.

What should be done is to inject the sinus with a fluid substance which by cooling becomes solid, and by molding itself in the lumen of the sinus causes equal and even pressure on the walls, thus obliging granulation tissue to develop evenly. Beck's bismuth paste or paraffin may be used, but I think still better results can be obtained by ambrine—a mixture of wax and resin—which melts at 60° C. and can be injected at a temperature of 70° C. into the sinuses.

Now, if the sinus is undergoing vicious

cicatrization, or if it is impossible to inject these pastes, modifying injections should be made directly into the perifistulous tissue, with thiosinamin thyiodide, or, better still, with thiosinamin, using the following formula:

R Thiosinamin, 10 grammes;
Glycerini, 20 grammes;
Aq. dest., 70 grammes.

A cubic centimeter of this solution should be injected every second or third day and usually effects a cure.

VI. The Treatment of Surgical Tuberculouses in Children by Artificial Venous Hyperemia.

It will be assumed that the reader is familiar with the technique and the instruments necessary for producing venous hyperemia in different regions of the body, therefore no allusion will be made to them, the writer merely desiring to give the indications and contraindications for this method in the treatment of various tuberculous surgical affections met with in children, based on his personal results.

As might be expected, the duration of the treatment is extremely long and it is quite impossible to give any mean estimate, the lesions themselves being more or less serious and more or less curable. But all things considered, the time required for a cure is unquestionably less than by immobilization in a plaster cast, and I do not think that the latter treatment ever gives such good ultimate functional results as are almost always obtained by venous hyperemia.

This procedure must not be regarded as a universal panacea—far from it. In many children in whom this treatment was begun I have been obliged to discard it after a fair trial because there was no evidence of amelioration. There are certain joints which lend themselves to this treatment better than others, and I am disposed to believe that the knee-joint is, for example, less favorable for this method than the instep, elbow, or wrist. As to the hip-joint, it completely escapes the hyperemia produced by the

hand, but abscess formation in this articulation can in some properly selected cases be dealt with by the application of suitable cups. Nevertheless I believe that one should not systematically exclude certain joints or certain regions from hyperemic treatment, because there is here only a question of the clinical form of the tuberculous process, and even in the case of the knee I have had several very striking results.

It is a difficult matter to describe distinctly differentiated forms of a disease whose lesions are usually mixed ones. However, it may be admitted that in a general way hyperemia is more effective in peripheral lesions involving especially the soft structures, and that it acts with far less effect in bone lesions in the strict sense of the term, and for certain forms venous hyperemia is completely contraindicated. I have found that peripheral tuberculosis of the tendon sheaths and white swelling at its onset when a fluid collection—hydrops tuberculosus—is present respond to the treatment under consideration quite quickly and distinctly. In these cases the bone lesions are often very trifling, the joint is large and distended, the tendon sheaths and the culs-de-sac filled with fungous products can be outlined under the skin, a pseudo-fluctuation is almost always detected, while movement is painful and generally limited.

By venous hyperemia the intra-articular fluid disappears, pain ceases, and the result is that movements become freer; then the condition remains stationary, and for months the treatment does not seem to produce any notable change. But nevertheless important changes do actually take place in the fungous products; their softness is replaced by a sclerous state, transforming the tendon sheaths into hard, thick cords. The sclerous tissue also develops around the cured joints, and this is one of the absolutely certain outcomes of hyperemia.

Occasionally, time may be gained by aspiration of the joint and withdrawal of

the fluid contents, but usually the amount of fluid removed is rather small because the fungous masses play an important part in the distention of the joint. The application of a cup after puncture will facilitate the issue of the fluid. But if the physician does not feel perfectly secure as to his asepsis, he should positively abstain from performing puncture of the joint, because it is a very serious matter to infect a closed tuberculous process, and, on the other hand, the hyperemia appears often to act better on closed tuberculous lesions than on the open ones.

When the case is a white swelling with marked osseous lesions, a distinction should be made between the large joints like the shoulder or knee and the small joints like the carpus or tarsus. The latter are particularly favorable for this treatment. Its action is first manifest on the painful phenomena, and it is really remarkable to see these very painful joints become almost painless after a few hours of treatment, while the vicious position assumed by the limb improves in a few weeks' time. On the other hand, as there is no immobilization by a cast, the vitality of the limb is better maintained, which is of capital importance, and the conditions of cure of the involved joint are much more favorable than in any other method of treatment with the exception of heliotherapy.

But a cure of the osseous lesions requires a certain time, and in these cases venous hyperemia is slow in its effects, but this surely applies to heliotherapy and to plaster casts as well. I have always noted that excepting those cases in which the complications present were in themselves contraindications for this treatment, the attending physician and patient were prone to be wanting in perseverance; several months or even years of a plaster cast with all its disagreeable features never frightened the patient, while a single month of treatment by venous hyperemia seemed very long. This can perhaps be accounted for because wearing no appliance and suffering less, the patient expects quicker results. Therefore,

when beginning this treatment it is well to warn the patient that patience will be required on his part, and when once the morbid process is well in hand it is better not to examine the parts too frequently in order to avoid depressing the patient—and the physician as well—by noting a state of affairs that they both believe to be stationary.

In cases of tuberculous lesions with sinuses the action of this treatment on the fungous products at the opening of the sinus is truly remarkable. This and the disappearance of the intra-articular fluid always surprise the patient and the family. The fungous products collapse, exuberant granulation tissue flattens out, and the cutaneous erythematous lesions in the neighborhood rapidly subside, while the sinus tends to close spontaneously without injections of modifying fluids or scraping.

It is interesting to note the disappearance of the pain, the joint becoming completely painless, and I have known patients who have had to be restrained from overexertion of the parts or from walking when the foot was the seat of the lesion, so complete was the recovery from painful phenomena.

I have had no experience with this treatment in cases of tuberculosis of the diaphyses. Therefore I am not competent to deal with this subject, but in tuberculous sinuses arising from necrosis of the ribs I have obtained excellent results. These lesions are particularly obstinate to treatment, usually requiring repeated scraping or excision. The resulting deformity in these cases is well known to all. In two cases the sinus closed in five weeks and left a slightly depressed cicatrix connected to the rib by a fibrous cord, the only remaining trace of the sinus. These patients have been respectively two and four years under observation and have remained cured.

Tuberculous tumors and abscesses should also be included among lesions proper for this treatment. The elastic band or cups should be chosen according to the site of the morbid process to be dealt with.

In lesions predominating in the bone, with

or without a sinus, seated in the elbow or knee, I do not think that venous hyperemia is capable of much good, and these cases should be treated by other measures, especially heliotherapy.

In order to briefly sum up my experience I would say that in these cases the improvement noted is confined to the concomitant peripheral lesions. The lesions in the bone persist, and will usually require surgical treatment for the purpose of extracting sequestra or giving issue to tuberculous matter pent up in the bone. Hyperemia will be powerless to act upon these lesions. It must not be supposed, however, that the time consumed in resorting to hyperemia *before* resorting to surgical measures has been lost. On the contrary, I have never had cause to regret this preliminary treatment. By decreasing the intensity of the peripheral lesions an improvement in the patient's general condition ensues, so that the surgical act can be undertaken in much better circumstances than otherwise. And I feel prepared to say that venous stasis is very useful after scraping or other interference on the bones, because it prevents invasion of the wound by fungous products and thus prevents interminable suppuration, which is frequently the consequence of surgical interference in tuberculous osteitides.

Among the tuberculous lesions of the small bones there is a peculiar form—namely, *spina ventosa*—which does not seem to be influenced by this treatment. I believe this is because the damage done by the lesion itself, and afterward by the operation which is always necessary, results in a useless finger, and that for this reason amputation is the only logical procedure.

It is hardly necessary to add that among the contraindications for venous hyperemia are cases of tuberculous arthritides of long standing that have reached the phase of pathologic dislocation. When they still suppurate the bone lesions are situated so deeply that the result of treatment is more than doubtful. If the suppuration has ceased and the joint has recovered with

ankylosis, osteotomy is evidently the only rational measure if the patient's health will permit of its being done.

Finally, when the evolution of the lesions is very rapid, as in the case of tuberculous osteomyelitis, or when the lesion is very advanced, the joint will then be very disorganized, being in reality nothing but a purulent pocket with an atrophied limb. Such serious lesions are a menace to the entire organism and require urgent treatment in order to avoid the development of rapidly fatal visceral lesions. Consequently there is no question about temporization and all conservative measures of treatment must be discarded, the only resort left being amputation.

VII. *Treatment of Actinomycosis of the Mammary Gland.*

From its very nature, actinomycosis in general is hardly an affection whose localizations are susceptible of undergoing retrogression *sponte sua*. Most usually all actinomycotic lesions offer this special character, namely, to invade and progress. Logically, actinomycosis of the breast should obey the same law of evolution that governs other local varieties of the process, and in point of fact it would appear that a mammary gland when once invaded by the parasite offers it an excellent soil for its development.

Undoubtedly the manner in which infection has taken place has its importance. Thus we know that primary actinomycosis of the breast is much less serious than the secondary form. But experience has also taught that secondary forms of the disease are unquestionably more frequent in man. No matter what may be the origin and pathogenesis, actinomycosis of the breast is in itself an important lesion, replete with serious consequences. It is not merely a simple destruction of an organ, but also and above all the slow and progressive disappearance of the patient's health that is serious. Therefore, this fatal outcome must be prevented at all cost, consequently early treatment is urgent.

Little need be said of medical treatment with iodine or with local injections or applications of this medicament. It appears, and this I know from personal experience, that usually surgical interference is the only chance offered for procuring a cure and, incidentally, recovery from the disease, upon the condition that the surgical act is resorted to in sufficient time. For that matter it is only when the phase of suppuration has been reached that we can be positive of the diagnosis. Now at this time it is of utmost importance not to lose time: excision of the breast is our only resource for obtaining a radical cure.

If by chance the physician is lucky enough to see the patient at the onset of the process, and therefore at a time when its nature can only be suspected, iodine treatment should be commenced. Since Poncet's numerous experiments we know that potassium iodide cannot be regarded as a specific of actinomycosis, no matter what may be said to the contrary. Nevertheless it is recognized, since the first papers published by Nocard, that the iodide will often render an immense amount of service, and very often its exhibition at the same time as surgical treatment is a precious adjuvant to the surgical act. It is unquestionable from the many data obtained by experimental work that potassium iodide has no action on the parasite whatsoever, but it produces around the parasitic masses an important leucocytosis which is followed by a process of sclerosis which swallows up the parasite and opposes an effective barrier to its development.

But if this end is to be obtained the lesions must be recent and the drug must be given at their onset, at a time when the true nature of the process can only be suspected. This is the principal point. As to the dose which should be exhibited, opinions differ. Some advise very small doses—fifty centigrammes to four grammes—given for twenty days with an interval of five days rest. Others on the contrary recommend massive doses of four to eight grammes for shorter periods and longer intervals of rest.

Now experience has shown that from fifty centigrammes to two and a half grammes has resulted in the cure of numerous cases of actinomycosis in other localizations than the mammary gland, so that these medium doses can be utilized with the hope of success in cases of suspected actinomycosis of the breast or in those in which a diagnosis has been made fairly early in the evolution of the lesions. Briefly put, *the treatment with the iodide will be effective only when begun at an early phase of the process and continued for a very long time.*

When the evolution of the process is already advanced and infiltration of the breast is very extensive, the iodide treatment may produce a temporary improvement, but not a cure, even when given at the daily dose of ten grammes, and I unhesitatingly say that when the process has become ever so little advanced the only rational treatment is surgical, because by

it only can a radical cure be obtained, and this means excision of the breast.

As soon as suppuration has become established I feel that it is very imprudent, to say the least, to defer operation. I have witnessed one or two disasters on this account, and therefore cannot admit the use of other measures advised in place of operation; consequently they will not be referred to.

In order to be successful the lesions must be completely removed. Total excision of the breast must be done and dissection must be carried out over the thorax. If any doubt exists as to the integrity of the aponeurosis or muscles they should be freely removed. The technique of the operation need not detain us; it is the modern procedure used for removal of the breast in general. The essential point is to accomplish a free and wide incision, the incisions being made in perfectly healthy structures.

3 RUE BELLOT.

Silver-salvarsan and Its Uses¹

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Silver-salvarsan was introduced into therapy early in 1918 by Kolle, of Frankfurt, the successor of Ehrlich, who was working on the drug at the time of his death. Extensive clinical use has indicated that this product is a decided step forward in the specific chemotherapy of syphilis.

Silver-salvarsan is the result of the activation and biological reënforcement of salvarsan with silver. It is a complex combination of the disodium salt of dioxidiamino-arsenobenzol with silver oxide, with the composition of $\text{Ag}_2\text{O} \cdot 2 (\text{NH}_2$

$(\text{ONa})\text{C}_6\text{H}_3\text{As})_2$, as shown by Binz, Bauer, and Hallstein.

The H. A. Metz Laboratories are making silver-salvarsan and have demonstrated its identity with the foreign product. It appears to be less toxic than salvarsan to experimental animals. Kolle and Ritz found that silver and its salts exert a decided antisyphilitic action on experimental syphilis in rabbits. The official toxicity test requires a 20-per-cent higher tolerated dose than salvarsan. Tests conducted by the Hygienic Laboratories of the U. S. Public Health Service have shown that its trypanocidal activity is approximately twice that of salvarsan and three times that of neosalvarsan. The increased antiluetic

¹ Read at the New York Academy of Medicine before the Greater New York Medical Association, April 18, 1921.

action of silver-salvarsan is explained by the synergistic action of silver and salvarsan.

The drug contains about 20 per cent of arsenic and 14 per cent of silver, and is a brownish-black powder, easily soluble in cold water, with an alkaline reaction.

This new arsphenamine product has been clinically employed in Europe for something over two years, and more than one million doses have been administered.

Since its clinical use in this country was commenced last October I have administered or been present at the injection of nearly 3000 doses. As a result of my observations I have reached these conclusions:

1. Silver-salvarsan is better borne than any of the other arsphenamines, a strikingly few reactions having come to my attention.

2. Chancres, mucous patches and condylomata disappear with great rapidity in the great majority of cases.

3. The quantity of the drug employed is very small, lessening the chances of reaction.

4. The serological results, as far as observed, are easily comparable with the other arsphenamines, both in primary and secondary lues.

5. Mercury is not actually necessary, at least in the primary and early secondary stages.

6. Many patients are able to return to their places of business from the hospital, clinic, or office, although this procedure is not to be recommended as routine practice.

The usual maximum dose is 0.25 gramme. This dosage is markedly in contradistinction to the maximum doses of arsphenamine and neoarsphenamine, 0.6 and 0.9 gramme respectively. The dose is based on the fact that silver-salvarsan is at least twice as active as salvarsan and three times as active as neosalvarsan.

My plan has been to administer to men and women alike 0.1 gramme at the first treatment. Four days later the patient receives 0.15 to 0.2 gramme, according to

sex and physical condition. The dosage is then increased so that men receive a maximum of 0.25 gramme for the third injection and women 0.2 gramme. In some instances I have given robust men 0.3 gramme and women, who could apparently bear a larger amount, 0.25 gramme, and in no instance has the slightest difficulty ensued.

When originally introduced into medical use the technique of preparation of the solution of silver-salvarsan called for the sprinkling of the contents of an ampoule on the surface of 5 Cc. of sterile, double-distilled water. It dissolves rapidly and completely. Then enough 0.4-per-cent sterile saline solution was added to make the dilution 30 Cc. per decigramme. This dilution, or one approximating it, has been used very largely in this country by many of the clinical investigators who are studying the drug.

On the other hand, a few physicians in the United States and very many in Europe utilize more concentrated dilutions with satisfaction.

Major Walson, U. S. Army (*Am. J. Med. Sci.*, March, 1921), who reports on the treatment of 800 cases with 6000 injections of silver-salvarsan, uses 20 Cc. of freshly distilled water, with no saline, for any sized dose and injects by means of a glass syringe. Kolle (*Deut. med. Woch.*, No. 2, 1920) has employed as little as 10 Cc. of distilled water to each decigramme of the drug.

I commenced by dissolving the silver-salvarsan in 5 Cc. of distilled water and adding 45 Cc. of 0.4-per-cent saline, making 50 Cc. of fluid to the decigramme. The injection was made with the salvarsan gravity apparatus. I then dropped to 40 Cc. of fluid per decigramme and later to 30 Cc., then to 20 Cc. per decigramme, and of late have been experimenting with 10 Cc. of distilled water to the decigramme, using no saline, and administering by means of a glass syringe. The patients appear to bear the concentration quite well,

only one reaction having been observed. I am not ready to advise this method as yet, however.

What is the purpose of the saline? Its use not only tends to produce a solution somewhat nearly isotonic, but more essentially it is added for the purpose of dispersing the colloid condition of silver-salvarsan sodium and thus tending to prevent any possibility of precipitation of the drug within the blood stream.

There is no doubt but that distilled water may be used, but the sodium chloride gives an added protection to the human economy.

Distilled water will produce little if any laking of the red cells. These statements are based on the work of Einstein and Bauer.

I feel, if one is to employ concentrated solutions, that three minutes by the watch should be utilized in introducing such a solution into the circulatory system.

Grave results are likely to follow a more rapid injection.

The technique of administration is similar to that of any other arsphenamine. Silver-salvarsan ampoules should be immersed in 95-per-cent alcohol for fifteen minutes. If no crack in the glass develops the ampoule is opened and the contents sprinkled on the surface of the water.

Upon the completion of the solution it should be filtered through previously moistened sterile cotton or gauze. The brownish-black solution is then put into the gravity apparatus or, if a sufficiently concentrated solution is to be used, drawn into the syringe.

As silver-salvarsan is believed to have an irritating effect upon the tissues, the operator should be certain that his needle is properly introduced. When the backward flow indicates free entrance into the vein, the tubing or the syringe is attached to the needle and administration is undertaken *very slowly*. Upon the withdrawal of the needle the site of the injection should immediately be covered with sterile gauze and manual pressure exerted. When bleed-

ing has stopped the area should be covered with collodion.

Mercury is not recommended for use in combination with silver-salvarsan, at least in the early stages. The progenitors state that "if silver-salvarsan is well tolerated by the patient, the use of mercury is not indicated in lues in the primary and secondary stages. Except for local treatment, mercury should only be resorted to after the salvarsan treatment has been stopped and in cases in which salvarsan treatment generally is not tolerated, or in patients who are hypersensitive to arsenic. This also applies to patients in whom the Wassermann reaction does not show negative results after from 10 to 14 injections."

Foreign observers are divided upon the advisability of utilizing mercury with the silver arsphenamine.

Gennerich (*Deut. med. Woch.*, No. 45, 1918) does not believe in the use of mercury. He positively states that he obtains negative Wassermanns quicker with silver-salvarsan alone than with other salvarsans even when mercury is employed. He is only in favor of mercury when a third course is necessary.

Galewsky (*Munch. med. Woch.*, No. 5, 1920) reports upon two years' experience with silver-salvarsan and says he prefers it alone rather than in combination with mercury. He is of the opinion that in the drug we have the best antiluetic yet brought out, and finds that it has less after-effect than any he has used.

There are, however, some men who prefer to combine mercury with silver-salvarsan.

Major Walson, U. S. Army (*ibid.*), gave practically all of his 800 patients mercury in the form of gray oil. His advice is to "give mercury with silver-salvarsan until it has been definitely proved that mercury is unnecessary."

I believe, with H. N. Cole (*J. A. M. A.*), that gray oil is of no value as a synergist to arsphenamine. Walson's success may be due to the action of the silver-salvarsan,

which he says (*ibid.*) "is the strongest spirocheticide, as well as being the least toxic of all arsenobenzol preparations, according to results obtained from animal experimentation, that has yet been introduced, and nothing has so far developed in its clinical application to contradict these observations."

It seems to be the general impression that silver-salvarsan has at least an equal serological effect with salvarsan or neo-salvarsan, but I have not carried a sufficient number of cases to a conclusion to enable me to form a definite opinion upon this important phase. I have had 22 cases which have completed at least one course. Of these 17 were changed from positive to negative. In three of the others there was a reduction in the degree of positivity, and in two others there was no change in the reaction. Three cases were tertiary, and the others primary and secondary. One of the tertiaries changed to negative; the other two remained positive and are receiving further treatment.

Major Walson says (*ibid.*): "Our syphilitic registers show 516 patients have completed the first, second or third course of treatment; approximately 70 per cent of these cases gave a negative Wassermann after first course of treatment, 25 per cent gave a negative Wassermann after second course of treatment, and 5 per cent gave a negative Wassermann after third course of treatment."

What is the amount of silver-salvarsan necessary? In treating syphilis I believe we undertreat our cases with arsenicals. When employing salvarsan in the ordinary primary or secondary case, I insist on not less than 20 injections the first year, given in three courses of ten, six, and four respectively, with an abundance of bichloride of mercury, 1 grain; two or three times a week intramuscularly.

A month should elapse between courses.

When neosalvarsan is the drug of choice, 24 injections, in three courses of twelve, six, and six respectively, is my routine.

Naturally I feel that silver-salvarsan should be given in equally heroic dosages. I am recommending that patients take three courses of twelve, ten, and eight injections, with intervals of one month.

Major Walson (*ibid.*) gives his cases 28 injections. His routine is:

"Treatment consists of four courses of silver-salvarsan and gray oil; an interval of four days between each dose in the first course of treatment and seven days in other courses.

"In the first course of treatment the first dose is fifteen-hundredths (0.15) gramme of silver-salvarsan.

"Second dose is two-tenths (0.2) gramme of silver-salvarsan, and each of the remaining five doses of the first course is three-tenths (0.3) gramme of silver-salvarsan.

"At the end of the first course of treatment a Wassermann blood test, and then thirty days' rest.

"In the second course of treatment three tenths (0.3) gramme silver-salvarsan for each dose, with seven-day intervals, then two and a half months' rest. Course consists of seven doses.

"The third course same as the second, with ninety days' rest.

"The fourth course same as second or third course.

"In conjunction with and at the same time of each injection of silver-salvarsan give eight-hundredths (0.08) gramme gray oil, intramuscularly.

"A Wassermann blood test is recommended after each course and a spinal fluid examination after the second course. During the second year of the disease every three months a Wassermann blood test and lumbar puncture with a complete serological examination of the spinal fluid. If at any time the Wassermann becomes positive treatment is renewed. If at the end of the twenty-fourth month the Wassermann blood test and spinal fluid are negative the case is considered cured."

It has been my privilege to familiarize myself with the work of a considerable number of observers in New York and

other cities, and the consensus of opinion is that in silver-salvarsan the profession has an addition to antiluetic therapy which bids fair to become the leader in the treatment of syphilis.

Silver-salvarsan is being utilized in a number of the hospitals in New York and throughout the country. At the Vanderbilt Clinic, New York, in the service of Dr. Fordyce, more than one thousand injections have been given under the immediate direction of Dr. Isadore Rosen, and Dr. Fordyce is also employing it in his work at the City Hospital.

Dr. M. B. Parounagian is using silver-salvarsan almost exclusively in his service at Bellevue Hospital.

The drug has been given extensive clinical use at the Skin and Cancer Hospital, in the service of Dr. Dudley D. Stetson; at the Corrections Hospitals, in the service of Dr. B. P. Thom; at the Volunteer Hospital, in the service of the writer; and in a number of the other leading institutions.

Diseases of Infants Due to Prolonged Feeding with Excess of Carbohydrates.

In the *British Medical Journal* of February 26, 1921, BLOCK states that common to all children fed on a carbohydrate diet is their great susceptibility to all infections. These children nearly always have some infection, most often of the mucous membranes or a simple dermatitis. When serious acute infections set in they will as a rule react with an enormous loss of weight, due to the surplus water in the tissues suddenly being excreted.

The prognosis of these cases is always very serious and distinctly unfavorable when the vital parts are degenerated.

The most important point in the treatment of these children is careful nursing and the use of stimulants. Furthermore, their diet must be altered so that they obtain the substances they have been without for so long—that is, protein and fat. The best way of doing this is to give them a wet-nurse. If one is not available they must be

fed on a diet the basis of which is sterile milk, diluted according to age. Care must be taken, however, not to give too large quantities at first. In particular, when giving cow's milk it is necessary to be very careful, as by taking more than can be digested the child might get chronic dyspepsia or genuine atrophy.

It is a mistake also suddenly to stop the supply of carbohydrates, and still worse to put these miserable children on a diet of water or tea, from which he has often seen the most disastrous results. When the milk diet is started the children must be given as much carbohydrates as they can digest at their respective ages. The best course to pursue is, naturally, to employ a wet-nurse at the same time, and in the most serious cases this is the only means of saving the child's life.

In these cases the feces become not only sour and fermented, but fetid and irritating; the skin of the buttocks gets red if the soiled napkin is left in contact with the child's skin only for a short time. If the irritation is repeated many times, the skin will be affected by weeping intertrigo all over the napkin area. It is, however, not only the skin which shows the effect of the irritation of these evacuations. The mucous membrane of the intestines, particularly the large gut, reacts at first with slimy secretion, later with hemorrhage, and with brisk peristalsis. As a consequence the child is restless owing to attacks of colic and frequent foul-smelling evacuations. Gradually there ensues a typical colitis, which in many cases is very serious. He has termed this disease "colitis amylogenetica," because of its association with carbohydrate, particularly starch. It occurs in a mild form in the younger infants; only the older and stronger children show characteristic "colitis amylogenetica," and his experience indicates that it is more frequent amongst children in the country. The reason why it is so frequent must be sought in the prolonged and ill-advised use of the so-called constipating diet. (During this treatment the child is often given only arrowroot and water, or barley water.)

Another cause of its frequency is no doubt to be found in the disinclination of many doctors to administer milk and milk preparations to children suffering from diarrhea, though a milk diet is undoubtedly in most cases the best treatment for chronic infantile diarrhea. Even in the case of infectious toxic cholera infantum a milk and water diet is much to be preferred to barley or oatmeal water.

He has seen quite a number of children wrongly treated by means of a long-continued constipating diet, and many of them have been in a most miserable condition, particularly when they have been simultaneously loaded with bismuth and silver nitrate, combined with enemas of the latter. He has seen children become scorbutic under this treatment.

The evacuations may remain watery in spite of the milk diet, which contains only trifling quantities of carbohydrates. It may in these cases be necessary to give the intestines a complete rest, by giving the child for one or, at the most, two days, boiled water only, or weak tea, without milk or sugar, but with saccharin if necessary. On the second or third day milk diet may be started (one part of milk and two parts of water); and at the same time may be given increasing quantities of protein milk. It is not easily fermentable, and therefore is most suitable for the treatment of these cases of chronic colitis. It is made as follows:

To one liter of rich milk is added one teaspoonful of Hansen's liquid rennet. The milk is then placed in a water-bath at a temperature of 42° C. for half an hour; it is poured through gauze, when the coagulum is collected and the whey drained off. The casein is now rubbed through a very fine sieve, and this is repeated ten times. The first few times the casein is mixed with half a liter of buttermilk, and later with an equal quantity of water. After mixing, the liquid should pass readily through the sieve. The protein milk is now boiled with continuous stirring and

the desired quantity of sugar added (usually 30 grammes of sugar). After the addition of sugar the milk is quickly cooled with continuous stirring, and then once more passed through the sieve. The prepared protein milk must be kept in a cool place.

Apart from the diet, he administers preparations containing tannin, preferably acorn cocoa in milk. If it does not agree he uses albumin tannate, which has the advantage over metallic salts of being non-toxic. It can be safely given in doses of a couple of grammes a day for a long time, even to quite young children. In some cases bismuth salts will give better results, the best being bismuth subsalicylate. If, however, the motions are not stained black, the drug may be stopped, as it is having no effect. As bismuth is a poison, it should never be administered for a long period, and it ought to be a fixed rule never to give bismuth, or preparations containing tannin, to a child when on a diet of water or tea. These constipating drugs will only give satisfactory results when taken with milk and milky or other foods.

The oatmeal and barley-water diet will generally be sufficient in cases of ordinary acute dyspepsia, particularly in those frequent cases in which the diarrhea is due to overfeeding with milk and milky foods, causing a pronounced protein decomposition in the intestines. Here it is essential that the barley-water should be thin and never sweetened with more than two per cent of cane sugar. Such a diet is meant to be a starvation diet, intended to give the intestines a rest. In the case of an ordinary diarrhea, the bowels will act normally after a few days of such a constipating diet, and the children may then gradually be given their usual food.

By the term "milk," as used above, is understood good fresh milk which has just been brought to the boil. Raw milk might have just the opposite effect, and this is the reason why children suffering from these intestinal complaints should always be given boiled milk.

Editorial

TWILIGHT SLEEP.

We have on more than one occasion discussed in the editorial pages of the *THERAPEUTIC GAZETTE* this subject, which attracted so much popular attention some years ago, and our Progress columns have not infrequently contained abstracts of articles dealing with it.

In a recent issue of the *Illinois Medical Journal*, Dr. Miner published her experience with twilight sleep in obstetrics. Becoming interested in this subject five years ago she went to Chicago to study it further. As a result of her experience she differs from those who have asserted, and many of these assertions have been made by persons of authority, that twilight sleep can be used only in institutions where the patient can be under constant observation with the assistance of trained assistants.

Dr. Miner believes that there is no reason why a woman in her own home should not be relieved as well as in a hospital provided the obstetrician will give her the time necessary for proper care. Nor is this time excessive in her opinion, because the scopolamine hastens the dilatation of the cervix, and this compensates for any slowing of the pain, with the result that labor is neither lengthened nor shortened. It is, however, essential that the physician shall be with the patient right along, or at least that a trained nurse who has had experience with this method shall be by the bedside of the patient.

Our readers will recall that some of the most ardent advocates of this method have stated that the patient should be blindfolded, should be placed in a darkened room, and if necessary that her ears shall be covered in order that noises may not arouse her. Dr. Miner disagrees with this view, claiming only that bright light is to be ex-

cluded, that no talking is permitted, and further, she asserts that almost always after the third injection the patient does not notice any ordinary noise or talking in the room. As soon as labor is really begun it is suggested that the first hypodermic be given. If it is not used until dilatation is half done or almost completed, the injections must be given at short intervals, as the pains are so severe that they arouse the patient, she becomes nervous, and possibly delirious, and therefore hard to control. In phlegmatic persons this condition rarely arises.

The author reports that her experience has been to the effect that blue babies are no more common with twilight sleep than without it, but the baby is usually quieter and usually sleeps more during the first twenty-four hours than a baby born without twilight sleep, which possibly is an advantage.

Concerning mental disturbance, Dr. Miner reports that her patients almost all of them keep up a little, almost constant, incoherent talk which commences after the second or third dose, and that this talking varies from a few words at each pain to a constant chatter as the child's head passes through the cervix.

The first hypodermic dose which is administered consists of $\frac{1}{8}$ gr. of morphia and $\frac{1}{100}$ gr. scopolamine, and this is all the morphia that is used, but the scopolamine is repeated as often as is needed. Usually it is repeated in an hour, and then every hour and a half to two hours, depending upon the condition of the patient. If the treatment is begun late in labor the second dose may be given in half an hour after the first and the third dose an hour later. After the first dose the patient is apt to be very thirsty, the cheeks are flushed, and she looks feverish. There may

be also frequent urination. As the child is born the patient is apt to be quite restless, and the physician must be on his guard that the mother does not roll over and hurt the child. The expulsion of the placenta does not cause the patient any trouble, and after it is expelled she usually goes into a restful sleep, which may last from two to six hours, although she can be roused during this time if it is desired. The baby should never be left in bed with the mother until after the first night is over, as she may roll over on it and smother it.

It has been claimed by some persons that the use of scopolamine interferes with the secretion of milk. This had not been Dr. Miner's experience. She also believes that there are a smaller number of lacerations of the cervix and perineum with twilight sleep than in ordinary labor. It has also been her experience that the use of the forceps is not more frequently required in this class of cases than in ordinary cases. In her last series of one hundred patients, she had four forceps deliveries, all of them primiparæ and three of them past thirty years of age. She has no hesitation in employing pituitrin with her use of twilight sleep if the cervix is fully dilated.

Concerning still-births she has had one in one hundred cases.

Last of all, this author points out that if twilight sleep is resorted to, everything abnormal which can occur may be referred to it unjustly. On the other hand, the patient is usually deeply grateful for relief, does not experience a feeling of exhaustion the day after, and cares little whether she has babbled foolishly while she was asleep. Dr. Miner claims that a woman once having had twilight sleep always insists upon having it at the next birth, but reiterates that its employment certainly requires more care and attention and constant attention on the part of the attending physician if things are to go well.

In discussing this paper Dr. Bertha Van Hoosen, whose contribution to this subject we have already published in part in the *THERAPEUTIC GAZETTE*, stated that Dr. Miner's experience was in accord with her

own, she having had a series of 2500 cases in which twilight sleep was used. She also stated that in these 2500 cases no woman had gone into convulsions while under the anesthetic, that she regarded it as of special value to the woman who has a lung, heart, or kidney complication.

It would appear that in the hands of these two women obstetricians, twilight sleep has proved an immense success. Possibly one of the chief reasons for this is that they have given far more attention to the patient minute by minute during the labor than is usually considered necessary, but doubtless many women would be willing to compensate the physician for extra time if labor could be made for them more comfortable.

FORMS OF HYPERTHYROIDISM.

While it is probably true that we know more about the function of the thyroid gland than we do about the function of any other gland of internal secretion, nevertheless there is still a very wide field of investigation to be explored in connection with its pathology and treatment. Many theories, more or less ingenious, have been advanced from time to time, and, as is the case with many conditions which are but partly understood, a multitude of recommendations have been made as to how cases of hyperthyroidism should be treated.

Every physician of large experience has met with cases in which some of the symptoms of hyperthyroidism were present, and yet the absence of exophthalmos and enlargement of the thyroid, to an extent where it could be seen and felt, have led him to an erroneous diagnosis. On the other hand, he has met with cases in which exophthalmos was marked, yet the gland was small, and still another type in which the blood-pressure was high, and in another case he has found it low. One type of case has responded fairly rapidly to medical treatment and another type has failed miserably under the same treatment, and similar results have been met with when surgical measures have been adopted.

For this reason we have read with a good deal of interest a communication by Boothby in *Endocrinology* upon "Adenoma of the Thyroid." He reminds us that Plummer some time since came to the conclusion that there are two separate distinct clinical types of hyperthyroidism, each of them characterized by definite pathological changes in the gland. In one of these, which may be called true exophthalmic goitre, there is exophthalmos with hypertrophy and hyperplasia of the gland, and in the other, where such marked changes do not occur, exophthalmos is absent, but adenoma of the gland is present. In this type of case a high arterial tension is usually met with, whereas in true exophthalmic goitre a low arterial tension is practically constant.

It would appear also from Plummer's investigations that there would seem to be an intermediate type of case in which there is present not only adenoma, but also hypertrophy and hyperplasia of the parenchyma, small adenomatous masses being scattered through the gland.

Other noteworthy points of difference are that the adenomatous type is prone to develop earlier in life than the exophthalmic type, but on the other hand the latter form is much more rapid in its development. Thus symptoms of hyperthyroidism are prone to follow within a few months after the enlargement of the gland is first noticed in exophthalmos, while many years usually pass between the development of enlargement of the gland and toxic symptoms in the type characterized by adenoma. This is an important point because it emphasizes the fact that an enlarged thyroid which may be taken for simple goitre, may be the first step in the development of a thyrotoxicosis, and that, therefore, measures for its relief should be instituted before severe symptoms develop. The writer has recently had under observation a case of this character, in which the patient has seemed to be slipping from what was thought to be a true goitre into a hyperthyroidism with a quickening of the pulse-rate, increasing nervousness, and some loss of weight in spite of a hearty appetite.

In this connection it is of interest that in the adenomatous type of thyrotoxicosis to which we have referred, not only is exophthalmos absent, but the gastrointestinal crises, thrills, and bruits, so characteristic of exophthalmic goitre, are also absent.

A point which probably does not receive sufficient attention from the general practitioner in the care of these cases is the fairly rapid development of myocardial degeneration which takes place when thyrotoxicosis is maintained. It would seem that this change is more characteristic of hyperthyroidism with adenoma than in the other type, perhaps because the heart has been subjected to a very moderate degree of thyroid intoxication for years before the enlargement of the gland has been noticed. In general terms it may be said that the exophthalmic type occurs ten years earlier in life than does the adenomatous type.

In both of these types of thyrotoxicosis there is an increased metabolic rate to meet the greater oxygen utilization which the condition demands. However, Boothby points out that the adenomatous type of hyperthyroidism may be divided into two classes, in one of which the basal metabolic rate is normal, and in the other exaggerated. On the other hand, in true exophthalmic goitre basal metabolism is practically always increased without exception.

It is interesting when we turn to the therapeutic side of this problem to note the very excellent results which are obtained by simple enucleation of the adenoma as compared with the results which are obtained in true exophthalmic goitre by operative procedure. In 67 per cent of the cases discussed by Boothby, the basal metabolism returned to normal within two weeks after operation. In other words thyroidectomy for adenoma may be said to almost immediately induce relief in the patient who has this type of hyperthyroidism. On the other hand it was found that in the exophthalmic type only 45 per cent reached normal level of metabolism at the end of two weeks even when the condition was mild, and in some of the patients of a severe type it was necessary to precede

thyroidectomy with single ligation of the thyroid vessel, followed in a short period by a second ligation.

Finally it is to be recalled that in the treatment of either of these conditions absolute rest prior to operative interference extending over weeks or even months is often essential, and that a similar period of rest after operative interference is also mandatory.

EFFECT OF LARGE AMOUNTS OF FLUID UPON BLOOD-PRESSURE AND THE NON-PROTEIN NITROGEN IN THE BLOOD.

It has been thought for a long time by certain clinicians that the taking of large quantities of water increased the labor of the heart and tended to raise blood-pressure, although physiologists have known that it is possible to inject very large quantities of liquid directly into the blood stream without any such changes taking place, the vascular system dilating, the kidneys getting rid of as much fluid as possible, and any excess beyond the capacity of the vascular system being poured out into the tissues.

No less an authority than Von Noorden believed that a large water intake raised blood-pressure. This may be true when the kidneys are diseased and are unable to eliminate water, but within reasonable bounds the ingestion of moderately large quantities of fluid is certainly without effect.

In a recent issue of the *American Journal of the Medical Sciences*, Miller and Williams report their investigations as to the effect of excessive fluid intake upon blood-pressure and the non-protein nitrogen in the blood. The use of the word "excessive" is entirely appropriate. One of their patients received as much as ten quarts of water daily, it is asserted without any inconvenience; another who apparently had some impairment of kidney function

suffered from marked distress when he took seven and a half quarts of water. The difficulty in getting the patient to swallow this quantity was overcome by the use of a Rehfuß stomach tube, which was left *in situ*.

As a result of their investigations they conclude that in patients with hypertension and presumably chronic interstitial nephritis large amounts of water may produce a very decided increase in pressure, and that this rise depends upon the slowness with which the kidneys are able to excrete water. In such cases, too, the vascular system has usually undergone fibrosis and so is less able to relax and contain immense quantities of water. They found that in the three cases they studied the use of excessive quantities of water for a period of six days was without effect on the urea nitrogen in the blood.

We quote these studies, first, because they are interesting as showing the enormous quantities of fluid which can be dealt with by the body even when it is not in perfect health. The amounts ingested are certainly far in excess of any quantity which a physician would prescribe in an endeavor to increase urinary flow, and the fact that such enormous amounts of liquid can be taken day after day for nearly a week well illustrates the wonderful ability of the body to adjust itself to unusual conditions of stress and strain even when it is not primarily normal.

BLOOD-PRESSURE DURING ANESTHESIA.

Readers of the *THERAPEUTIC GAZETTE* will remember that about two years ago we published in our Original columns a contribution by Dr. Warren B. Davis in which he embodied his observations on blood-pressure as to the effect of nitrous-oxide-oxygen inhalations for anesthetic purposes during operative procedures. It will be recalled that his conclusions in general were to the effect that if nitrous-oxide-

oxygen were given with skill sufficient changes were not produced in blood-pressure to be considered factors in the progress of the patient.

Many years ago the writer of this editorial note published a report as to the influence of ether inhalations upon body temperature and showed that in many cases such inhalations very markedly lowered temperature. At various times other papers have appeared as to the influence of posture upon blood-pressure during surgical anesthesia, and there can be little doubt that heretofore too little attention has been paid to posture during operation.

In a recent issue of the *Pennsylvania Medical Journal*, Miller has reported his investigations concerning the blood-pressure during operative procedures when general anesthetics were used. He found that routine blood-pressure estimations showed that if surgical trauma was not too severe and a smooth light anesthesia was maintained, in an organically sound patient in the dorsal position, no material changes took place provided there was no hemorrhage or obstruction to respiration. Hemorrhage, however, rapidly lowers blood-pressure, and in one instance that he cites, in the space of ten minutes, the systolic pressure dropped from 150 to 90 and the diastolic from 110 to 80. These facts, as we have just stated, hold true, however, chiefly in regard to patients who may be considered in general terms as normal. He well points out that in stout patients, particularly if they have damaged hearts, change in posture and protracted abnormal postures may do damage, and where for any reason there is respiratory obstruction there may be great variations in systolic pressure and in pulse pressure with little variation in the diastolic pressure. If, however, the obstruction persists there is a steady fall in both systolic and diastolic pressure.

It is interesting to note that Miller found that a falling blood-pressure could quite frequently be traced to dyspnea arising from a surgical assistant resting on the

patient's chest, a habit which we believe from observation to be by no means unusual.

Possibly the most important part of his contribution deals with the relationship of posture to pressure. Thus, in several instances the change from the dorsal to the Trendelenburg position was immediately followed by a fall of 60 mm. in systolic pressure without an immediate effect upon the pulse-rate, and curiously enough a change from the dorsal to the prone position had an even greater effect upon the blood-pressure, although usually this fall is quickly rectified. In the lithotomy position the systolic pressure is increased, but practically always in the Trendelenburg or the reversed Trendelenburg position the systolic pressure rapidly declines. More important than all of his statements would seem to be the assertion that the routine use of the Fowler postoperative position has undoubtedly caused death in many patients. In other words, it would appear that this position should not be assumed until the shock of the operation and the effects of the anesthetic have passed away. So far as the effect of the anesthetic itself is concerned, there is frequently a rise in systolic pressure as anesthesia is induced, which may be in part psychic. A profound anesthesia lowers systolic, diastolic, and pulse pressure.

Miller quotes with approval the rule of Moots for estimating the vital resistance in terms of the blood-pressure ratio, to wit: if the pressure ratio, a fraction having a pulse pressure as numerator and the diastolic pressure as denominator, is high or low there is reason to apprehend danger. If the pressure ratio lies between 25 per cent and 75 per cent the case is probably operable. If outside these limits it is probably inoperable.

He also quotes with approval McKesson's rule to the effect that with a diastolic pressure of 80, a pulse pressure of 20, and a pulse rate of 120, a critical point has been reached in the operation, and that after a half-hour, if such condition has been main-

tained, almost every patient succumbs shortly or within three days.

Last of all Miller wisely deplotes the fact that blood-pressure estimations are so seldom resorted to before, during and after surgical procedures, with particular emphasis upon failure to study the blood-pressure while the surgeon is actually at work. This is a point that we have always insisted upon and desire once more to emphasize in these pages.

LATENCY OF SYPHILIS.

Engman and Eberson have conducted a biologic study on this subject, of importance not only to the individual, but having a distinct bearing upon all efforts directed toward control of this disease as a public health menace; and note that following infection of virus on an open surface, the organisms proliferate, are quickly carried into the general circulation, and continue to increase both locally and generally until the period of multiple systemic localization occurs (*Archives of Dermatology and Syphilology*, April, 1921). Wherever the colonies of spirochetes are formed they seem to stimulate the same cellular reaction—i.e., the formation of lymphoid cells, plasma cells, and new connective tissue cells, and sometimes giant cells. These cells have not the power of reorganization and have a tendency toward resorption and disintegration, but during their formation there must be something manufactured *in situ* whose action seemingly is a destructive one upon the spirochetes, since even without treatment there is a tendency for the local lesions to disappear. Such involution is the natural clinical course of all early lesions of syphilis. The antibody, or inhibitory agent, causing the lesion to disappear must be manufactured at the local sites of colony formation, in which event it may be carried by the lymph stream, absorbed into the general circulation, and may exist in the blood stream in quantities sufficient to have a distinct effect on other colonies in the body. There is at least abundant clinical evidence to establish the

probable fact that during the invasive eruptive stage of the disease such a substance is formed and has a deterrent effect on the organism of syphilis.

Though there are some cases in which relapsing cutaneous lesions persist or cerebrospinal or vascular syphilis of an acute nature may occur, with time the pathogenic action of the spirochete seems to be diminished and the organisms remain in a more or less permanent latent condition in the system. They may coexist in various organs and tissues of the body, causing no appreciable symptoms. Whatever the resting-place of the spirochetes may be, they probably appear in the blood stream at stated periods. This latency is well recognized in other infections, notably tuberculosis, but in syphilis it is probably even more important than in that disease. The truest type of latency is best illustrated clinically in the so-called Colles women, who, although bearing syphilitic children and themselves presenting a positive Wassermann reaction, in a large majority of cases do not show any clinical symptoms of syphilis. Even though one may appreciate the difficulty of demonstrating all the clinical effects that may be produced by *Spirochæta pallida* in a given host, these women are the best examples of latency.

The surface of the skin is larger than the surface of any other tissue of the body. Therefore, when an invasion of spirochetes occurs so that the skin is well inhabited by disseminated colonies, it is highly probable that a larger amount of the immunizing substance is manufactured than in those cases in which the skin is not diffusely involved. It is obvious, for the reason cited in the foregoing, that the large surface of the skin would manufacture more immunizing bodies than any of the other tissues of the body which do not react so vigorously to the spirochetes. In other words, the skin in this disease and probably in other eruptive diseases is the source of those bodies which influence the repression of the organisms causing the disease. At any rate, clinical experience points to the fact that those cases which have pre-

sented in their clinical course an uncomplicated wide-spread cutaneous eruption are less severe as regards life and general health than those which do not run such a cycle.

From certain evidence produced by spirochetes obtained from cerebrospinal syphilis, it seems highly probable that these types of infection may not be due in any instance to a "latent" parasite. The subsequent cerebrospinal disturbance known as paresis and tabes is produced initially by the invasion of the nervous system early in the disease. It is evident from previous consideration that these spirochetes which are implanted in the nervous tissues, and therefore not readily accessible to antibodies which might be elaborated in other parts of the body, such as the skin particularly, would be uninfluenced by these cell-formed products and therefore not subject to those influences which might tend to produce latency.

An active infectious syphilitic patient is manifestly a source of contagion and is easily recognized as such. The problem by its frank nature becomes relatively a simple one. On the other hand, the problem of the latent syphilitic patient is not to be met so easily. The study of this phase of the disease presents many angles, the most important of which is the relationship to the community and to his offspring of one who harbors live parasites in a latent form.

The blood in cases of florid syphilis appears to be infectious to some extent. Positive inoculations have been reported from different sources, but it appears that the spirochetes are never numerous, and the danger attending contact with patients' blood in the making of Wassermann tests or in gynecologic work is probably exaggerated.

That the blood is not highly infectious is borne out by clinical observations, as well as by those who are obliged to come into contact with patients. Spirochetes may be found in the blood stream from about three to four weeks before the secondary rash. In untreated cases they may be present six months after the beginning of symptoms.

In relation to infant mortality, statistics reviewed by Jeans show that about 10 per cent of married women are syphilitic and about 10 per cent of marriages involve syphilitic persons. Of all births in a syphilitic family, 75 per cent are infected; 30 per cent of pregnancies end in death at or before term; 30 per cent of all living children born in a syphilitic family die in infancy. In all probability from 25 to 30 per cent of clinically syphilitic infants die as a result of syphilis. Only 17 per cent of all the pregnancies in syphilitic families result in living non-syphilitic children who survive the period of infancy. Apparently healthy mothers may give birth to syphilitic children, not only from the first husband who was syphilitic, but from a second or third healthy husband.

There is abundant clinical evidence that a large number of latent syphilitic persons, who have received no treatment or inefficient medication, exhibit general adenitis. In women one sees often nothing more than cachexia and joint pains, and often no symptoms other than a swelling of the inguinal glands. For many years such women may appear to be well. The part played by latent syphilitic women in transmitting the disease to offspring is probably greater than heretofore surmised. Experimental evidence is meager. In two instances it was found that inguinal glands from women who gave no history of syphilis and were to all appearances healthy, were capable of infecting experimental animals with the disease. Buschke and Fischer reported the finding of spirochetes by puncture in the inguinal gland of a woman who showed no sign of syphilis, and who gave birth to a syphilitic child.

Transmission by means of the semen, while supposed to take place by the entry of *Spirochæta pallida* into the spermatozoön or by infection of the ovum with the spirochete, is not accepted universally on the ground that the spirochete is too large to enter the spermatozoön, and for the same reason cannot enter the ovum without destroying it. Hochsinger reports a study of seventy-two families in which

paternal syphilis was present and the mothers were free (?) from disease during the periods of from four to nineteen years, although examined repeatedly. (In fifty cases the mothers were under observation for more than six years.) Seventy mothers gave birth to 276 children: 110 were still-born, 166 syphilitic, and 31 healthy.

Spirochetes seem to have a decided affinity for the testicular parenchyma. As a rule, the syphilitic process is confined to the testicle. From Finger and Landsteiner's studies, in which two positive inoculations were obtained out of four, we can conclude that semen may be infectious even when there are no syphilitic processes in the genitalia, since in one instance he dealt with a case of recent syphilis with no testicular involvement. Pathologic studies by Warthin have demonstrated the presence of spirochetes in active cellular infiltrations of the testes.

It has been shown by experiment that inguinal glands and semen obtained from persons clinically free from syphilis are infectious, proving that latent syphilitic patients may be considered as sources of danger in the spread of the disease to offspring and to the community. The fact has been established that *Spirochæta pallida*, though remaining dormant in the body of a person, may retain its virulence and infectivity for an indefinite period.

The finding of virulent spirochetes in the inguinal glands and in the semen of latent syphilitic patients suggests that certain parts of the body act as reservoirs from which the spirochetes may be discharged from time to time. How long the carrier state may persist cannot be determined, except by study of a large series of cases. What is of vast importance is the fact that residence within the host does not render innocuous the organisms responsible for the disease.

Spirochætæ pallidæ were isolated from patients who gave a history of syphilis dating back eleven and thirteen years in two instances, and one year in three instances. An inguinal gland and the semen proved positive for spirochetes in the two first cases

mentioned, and the glands and semen in the last named. In this series of positive results a gland was found to be infectious in the case of a man whose Wassermann reaction had been negative, following treatment, and at the time of taking a specimen for the experiment gave a double plus reaction in the cholesterin antigen only. A second instance of this nature was found in the case of a specimen of semen which proved positive for *Spirochætæ pallidæ*.

It appears from this investigation and from that of others that the blood and other body fluids, excepting semen, are not infectious in latent syphilis, or if so, rarely.

SPINAL CONCUSSION.

For many years there has been a discussion as to whether there really be a condition of concussion, by which is meant a jar, which, while not producing recognizable lesions, may cause a more or less lasting cessation of function. The surgeons have held, and apparently proven by autopsy or operation whenever opportunity offered, that symptoms other than those which were transitory in nature were always indicative of lesions. Others in the light of clinical experience have apparently shown that symptoms may persist for days or even weeks, and yet complete ensuing recovery may demonstrate there were no lesions or at least none such of sufficient grossness to have been recognized at the autopsy, had there been opportunity afforded for the making of one.

Casamajor (*New York State Journal of Medicine*, March, 1921) revives a subject which has not recently taken a prominent part in current medical literature, quoting Spiller, who reported the case of a cat which had complete paraplegia with anesthesia of the hind legs and tail. On autopsy two hours after the injury the spine was found uninjured, and there were no evidences of crush or hemorrhage of the cord. Four years later the same author reported

a similar condition in a man who fell about eight feet. This occurred during the night, and the patient was found in this position, unconscious, the next morning. On the second day after the accident he was conscious. His bladder and rectal control were lost and there was very little voluntary motion in the lower limbs. Voluntary movements at the elbows and shoulders were much impaired and completely lost in the hands. The sensory changes were interesting. Touch was normal throughout, but pain and temperature were much impaired up to the base of the neck, including the arms. The knee-jerks were reported as normal and equal at this time. On the seventh day the right knee-jerk was diminished and the left absent, and there was a positive Babinski on each side. On the fourteenth day the patient could move his legs and toes freely while in bed. The knee-jerks were much diminished but equal. Touch sensation was normal all over. Temperature sensation diminished up to his clavicle on both sides, while the pain sensation had returned to the legs below the knee and to the anterior surface of the right thigh. He had more muscular power in the movements at the shoulders and elbows, but could not move the hands. On the thirtieth day there was noted feeble flexion and extension of the hands and fingers. He died on the thirty-eighth day: the cause of death was not stated. On autopsy there was found no fracture or other lesion of the vertebræ, no hemorrhage in or crush of the cord. However, there was found a diffuse area of softening extending through the fourth and fifth cervical segments with definite signs of ascending and descending tract degenerations from this point. In this case there was a definite myelitis without crush or hemorrhage following a trauma which did not injure the spine.

Prior to Spiller's reports, Schmaus and Kirchgüsser produced spinal-cord concussion experimentally in animals. The method employed was to place a board over the animal's spine and strike it sharply with a hammer. The latter author gives detailed reports of his experiments. He used rab-

bbits, and placing the small board on the spine over the lumbar enlargement of the cord, he struck it sharply with a hammer. After the second or third blow there was a definite convulsive spasm in the hind legs. The hammer blows on the board were continued until the hind legs were completely paralyzed. This paralysis lasted from five minutes to half an hour. The six rabbits were killed six to fourteen days after the injury. The spine was found uninjured. There was no hemorrhage in or crush of the cord. In the lumbar enlargements Marchi stains showed some degeneration of the white fibers.

Spiller's case and the laboratory study showed the possibility of degenerative lesions of varying severity due to concussion of the cord without gross injury. Casamajor reports the case of a patient admitted unconscious. On return of consciousness it was found that both arms and hands were completely paralyzed and anesthetic, and he could control the movements of his legs very little. There was no paralysis of the bladder or rectal sphincter. His legs had been getting stronger, but he could not stand or move his arms or hands at all. Physical examination on admission showed normal pupils and some slight nystagmus on looking to the left. Other cranial nerves were normal. The neck was stiff and could not be moved either actively or passively on account of pain. X-ray showed no fracture or dislocation in cervical or upper thoracic spine. The right arm was in a state of complete flaccid paralysis, while the left showed some voluntary motion of the shoulder and arm muscles but not enough to move a joint. There was double drop-wrist and no voluntary movement of the fingers of either hand. Muscle tendon reflexes were absent on the right and very weak on the left. Abdominal and cremasteric reflexes were lost on both sides. While the patient lay in bed all leg, thigh and foot movements were present, but so weak that he could hardly sustain the part when raised from the bed. The knee and ankle jerks were extremely active, right greater than left,

but there was no Babinski on either side. There was rapid improvement, but opportunity was not offered for observation of complete recovery.

It is within the experience of many surgeons that cases of injury to the spine in the form of overflexion or bruising trauma may be followed by paralysis so complete as to simulate a complete transverse lesion; that this paralysis may disappear in the course of hours or days or weeks. Doubt-

less some of these cases have been operated upon without finding their way into literature. The importance of the paper quoted in this article and of recalling instances of more transitory nature is incident to the fact that before proceeding with surgical intervention it is often wisest in the absence of x-ray findings showing bony displacement to allow sufficient time to elapse to insure a diagnosis of conditions other than concussion.

Progress in Therapeutics

Medical Therapeutics

The Action of Cascara Sagrada.

MCGUIGAN, in the *Journal of the American Medical Association* of February 19, 1921, states the fact is that cascara should never be used as a cathartic but only as a laxative. When more than 2 Cc. is needed some other drug should be used. Many of the supposed virtues of cascara are possessed by liquid petrolatum and by phenolphthalein. The correct dosage of cascara has been emphasized by Hare, who states that more than 2 Cc. of the fluid extract often produces irritation of the bowel, and enteritis and intestinal catarrh. Its continued use tends to produce hemorrhoids in some persons. In his own case, confirmed by others, he is willing to accept this as the true statement of the action. The abdominal tenderness and griping, and indefinite abdominal symptoms, indicate a congested or inflammatory condition. He did not feel justified in administering larger doses of this drug, and none of those taking 4 Cc. volunteered for this purpose; in fact, they did not wish any more cascara. However, he has studied the effect of massive doses on dogs. He mentions Bastedo's patient, who swallowed 30 Cc. of the fluid extract

by mistake. There was excitement, hallucination, weakness of the legs, and collapse, from which the patient recovered. Bastedo does not record griping or other untoward symptoms. With such a large dose one might expect vomiting, but this rarely occurs. It should be noted that preparations of recent bark have a tendency to produce vomiting and epigastric pain; large doses of the matured preparations still retain some of this property. Busey reports a case in which 4 drachms was given to a patient by mistake, instead of ergot. No especial toxic symptoms are recorded, but the patient was in such a state of great depression that only pronounced changes would have been noted.

Fenn reports several cases of the untoward effects of cascara after "moderate doses" in which there was vomiting; heat and griping; traces of blood in the evacuations; increase of flatulence; abdominal tenderness; and mental aberration. In one case death followed the taking of cascara. In none of these cases, however, does he give the dose taken. The cases of mental aberration and death have occurred in old people who had prepared their own deco-

tion from the dried bark. Cotter reports a case in which a drachm dose, given at night and repeated in the morning and at noon, evoked symptoms resembling cholera morbus. In a second case in which a woman took a drachm dose at night and repeated it in the morning, there was great prostration and feebleness.

A few practitioners have told him they have used this dose three times a day over long periods with good results. This is against the verdict of the literature, and better results for long-continued use seem to be obtained with smaller doses. Wood gives the dose of the fluid extract preparation as from 2 to 8 Cc., which is manifestly far too great, especially since we have better cathartics when such large doses are needed.

Rectal Injection of Massive Doses of Neoarsphenamine.

MEHRTENS, in the *Journal of the American Medical Association* of February 26, 1921, concludes:

1. Neoarsphenamine can be safely given intrarectally, in doses as large as 4 gm.

2. Arsenic is absorbed into the blood after such injections, and larger quantities are eliminated in the urine than after ordinary intravenous injections of arsphenamine.

3. Arsenic persists longer in the blood in perceptible quantities after the rectal method with large doses than after ordinary intravenous methods.

4. About equal concentrations in the spinal fluid are obtained with either method.

He believes that, all things being equal, the intravenous method of administering arsphenamine and neoarsphenamine is still the method of choice in most cases. But, based on the foregoing conclusions, he feels that the rectal administration of neoarsphenamine has a place in therapy when massive doses are used, especially in the cases of children, those with difficult or impossible veins, and in the case of those in whom, for any reason, intravenous injections are dangerous or undesirable.

Administration of a Pituitary Extract and Histamine in a Case of Diabetes Insipidus.

In the *Archives of Internal Medicine* for March, 1921, GIBSON and MARTIN cite a severe case of diabetes insipidus with chronic syphilis which they had studied. The symptoms were not relieved by lumbar puncture.

The subcutaneous administration of pituitary extract (doses, 1 Cc. each, of the obstetrical preparation) was effective temporarily in increasing the concentration and reducing the volume of the urine, as reported by other observers. A normal twenty-four-hour volume and concentration were not obtained.

Histamine (1 injection of 0.2 mg.) gave a similar but less effective result. It is probably not the active principle of the pituitary gland.

Desiccated whole pituitary substance in four 3-grain doses by mouth had a slight immediate effect.

On the day following the first injections of the pituitary extract, and on subsequent and intervening non-pituitary extract days, there was a maintained decrease in the polyuria from over 15 liters to about 10 liters per day and a relative increase in the concentration of the urine.

Nitrogenous metabolism (over twenty-four-hour periods) is affected in part as in the case of a normal person with a large water intake (Hawk). High ammonia, uric acid, and particularly undetermined nitrogen figures, were obtained; there was no creatinuria. As the result of pituitary extract injections, there was a lower nitrogen elimination with considerable retention, diminished ammonia and undetermined nitrogen, and a somewhat increased uric acid output; the nitrogen partition was more nearly normal.

Glycogenesis was not reduced. There was hypoglycemia. Blood urea, creatinin, plasma chlorides, and total plasma proteins were normal. The very high blood uric acid figures obtained may be explained as an effect similar to that of pituitary extract administration in non-endocrine cases.

Fat-soluble Accessory Factor in Cod-liver Oil and Butter.

In the "Clinical Notes" column of the *Lancet* for February 12, 1921, ZILVA and MIURA state that the therapeutic value of cod-liver oil, especially in the treatment of rickets, has long been appreciated by the clinician. The cause of this remarkable potency has not yet been satisfactorily explained, but the results of recent researches on the accessory food factors strongly favor the view that it is due to the presence of the fat-soluble factor in the oil. Mellanby's experiments with puppies point to the great probability that a deficiency of this factor in the diet is associated with the etiology of rickets. Cod-liver oil, however, has shown itself always in the treatment of rickets to be superior to other substances which contain the fat-soluble factor. Results obtained by them in connection with another inquiry seem to offer a possible explanation of this apparent inconsistency.

Their present knowledge of the distribution of the fat-soluble factor in nature is of a qualitative character. It is based on a technique which consists of feeding young rats on a diet adequate in every other respect, but lacking this factor. On such diet the animals decline, but on the addition of a substance containing the principle they resume normal growth. They have been engaged for some time in an investigation with the object of working out a method for the estimation of the fat-soluble factor on quantitative lines. From numerous experiments they have succeeded in ascertaining the necessary conditions under which results of a quantitative nature could be attained, and the method so far worked out, although not perfect, affords the opportunity of comparing the relative content of the fat-soluble factor in various substances with a reasonable degree of accuracy. In this investigation they had the opportunity of testing a variety of substances, and they were struck by the extremely high potency of cod-liver oil. This was specially marked in the case of a sample of crude unrefined cod-liver oil, which was found to be 250 times as potent

as butter. The samples of refined cod-liver oil which they examined, although not so active as the crude oil, were also far superior in their activity to butter. It is their opinion that this superiority in potency of cod-liver oil to other substances is responsible for the remarkable results achieved with it therapeutically.

Unfortunately, in order to satisfy the requirements of the public there is a great tendency to produce brands of cod-liver oil which retain little of the characteristic taste and which appear almost colorless. In order to achieve this, very drastic means may often be employed which conduce to the partial or even total destruction of the accessory factor. In this connection one may point out the great instability of the fat-soluble factor when exposed to air and ozone, the latter substance being very often employed as a bleaching agent in many industries. It is hardly necessary to point out the serious consequences which might arise if in the process of refining this exceptional activity of the cod-liver oil were to be vitiated or destroyed in the manipulation of certain preparations.

Ovarian Substance.

In the *Journal of the Missouri State Medical Association* for February, 1921, ROYSTON states that ovarian substance, administered subcutaneously and intramuscularly, is an agent of the greatest value in relieving symptoms caused by a deficient ovarian secretion. The intravenous administration is not advised at the present time because of reactions resulting in two patients in his series. These reactions both occurred immediately following the injection and exhibited the following symptoms: immediate and pronounced headache, nausea, faintness, hysteria, all of which continued for some twelve to fifteen hours following the injection. In view of the fact that two reactions followed the intravenous administration of ovarian substance and none has resulted in his hands from corpus luteum, there seems to be some difference in their action. The most striking

effect is shown upon those cases of menopause with an irritable sympathetic nervous system, for which the substance seems almost a specific in properly selected cases.

Certain cases of functional amenorrhea and nausea and vomiting of pregnancy are definite indications for the administration of ovarian substance, though it apparently has no advantage over corpus luteum in the latter condition. The results obtained will depend upon an accurate diagnosis and a proper selection of the cases treated.

Vitamines.

The *British Medical Journal* of February 12, 1921, in an editorial on this subject, states that the current issue of the *Biochemical Journal* contains a number of papers dealing with conditions which determine the presence of vitamins and bring about their diminution or destruction in the course of the preparation of food for the table. Gowland Hopkins points out that a knowledge of the conditions affecting the stability of vitamins is not only of practical importance in connection with the commercial and domestic treatment of food, but would also be of value in guiding attempts to isolate them, and in limiting hypotheses as to their nature. Many investigations made during recent years of the fat-soluble A vitamin have shown that animal fats, with the exception of lard, are decidedly richer in it than vegetable oils. Conflicting statements have been made as to the resistance of this vitamin to heat. Some experimenters have concluded that it is thus readily destroyed, but in his paper opening the discussion in the Section of Medicine at the annual meeting at Cambridge, Hopkins confirmed the statement of Osborne and Mendel that it is resistant to heat. The explanation of the difference of opinion, he states, is that while the vitamin in butter is not diminished by exposure to a temperature of 120° C. for four hours, it is within the same period greatly diminished and in twelve hours altogether destroyed if the butter is thoroughly aerated during the heating.

Drummond and Coward now give an account of an experiment which led them to the same conclusion. The probability is that the destruction of the vitamin is due to oxidation, and this appears to be confirmed by Hopkins's observation that vitamin A disappears from butter spread in thin layers and exposed to air at temperatures of 15° to 25° C.; Drummond and Coward found that the loss was considerable at 37° C. Lard, as has been said, has been looked upon as an exception to the rule that animal fats contain vitamin A. This seems to be due not to the complete absence of vitamin from the body fat in pigs, but to two circumstances—first, that the diet usually employed to fatten pigs is not rich in vitamin A, and secondly, that in the process of manufacturing lard, which involves raising the fat to a temperature of 102° C., much of any vitamin A there may be must be destroyed.

Drummond, Golding, Zilva, and Coward relate an instructive experiment made on a litter of Berkshire pigs. For the present purpose it will be sufficient to say that it demonstrated storage of vitamin A in the body fat of pigs receiving a diet containing considerable amounts of vitamin A, yielded, in this instance, by fresh grass. The fat of the pig, probably because the animal fattens quickly, contains less vitamin A than that of other animals, and when a young pig is fed on a diet very deficient in vitamin A, such as toppings and whey, it may not be possible to detect that vitamin in the body fat.

An interesting point as to the value of milk in maintaining growth is discussed in another article by Professor Hopkins; in one of his earlier papers on accessory food factors (1912) he had described the startlingly favorable effect of adding minute amounts of milk to synthetic dietaries incapable by themselves of maintaining the growth of rats. Experiments made later by Drummond and by Osborne and Mendel failed to yield the same results, and those made by Hopkins himself in the winter of 1919 were disappointing, for though the animals which received the small quantity

of milk kept in better health and lived longer than those on a synthetic diet alone. they grew very slowly and their death-rate was high. In another set of experiments which he began in April and May the contrast between animals receiving the small quantities of milk and the others which received none was as marked as in his earlier experiments. The difference in the diet of cows in summer and winter suggests itself as a probable explanation, and McCarrison has laid stress on this point. Osborne and Mendel, however, were unable to show that this factor influenced their results, and an experiment Hopkins made with goats gave no support to the theory. There is seasonal variation in the growth of energy of rats, but Hopkins doubts whether this would account for the experimental difference, and regards the question as still open.

The Treatment of Uterine Hemorrhage Not Associated with Pregnancy.

In the *British Medical Journal* of February 12, 1921, PHILLIPS states that until our knowledge has so improved that we are able to control the delicate balance of internal secretions, on the upset of which appears to depend for the most part excessive uterine hemorrhage, in his opinion it is desirable to perform hysterectomy in all such cases whenever the bleeding is severe enough to make the patient to any extent an invalid. He says that he is old enough to remember the time when it was considered so dangerous to remove a uterine fibroid that gynecologists more often than not suggested not operation but rest and drugs. when a woman anywhere near the menopause had a fibroid which did not actually threaten her life by reason of the profuseness of the bleeding. One of his most vivid memories is of coming away from a visit to a woman of some fifty years of age, who had spent perhaps a dozen years constantly lying down either in bed or on a couch in an adjoining room; he was told that she had been all these years awaiting the cessation of a metrorrhagia due to a fibroid. He had watched Greig Smith

remove large myomatous uteri safely and easily, and had seen more than one blanched feeble creature return a few months later to thank the surgeon for renewed vigorous health; and the contrast of a highly educated woman, whose keenly enjoyed activities had been brought to an end at the age of forty, was his first big stimulus to do surgical work—not just to save a patient from impending death, but from the far more ghastly death-in-life which constitutes existence for so many chronic invalids.

Briefly, in turn, bleeding (1) at puberty, (2) during the child-bearing years, and (3) about the period of menopause must be considered. Bleeding at puberty may be severe, but it practically always rights itself, and he has never even heard of a case which required hysterectomy. It is probably due to imperfect balance between the various internal secretions.

Excessive bleeding during the child-bearing years is, as stated before, most commonly due to fibroids, and, in his opinion, hysterectomy is indicated in almost every case in which excessive bleeding, either menstrual or intermenstrual, is associated with the presence of a fibroid. Apart altogether from the bleeding or other urgent symptoms, there can be no doubt that fibroids interfere with good health. The association of myocardial degeneration and aortic disease with large fibroids is too frequent to be merely coincidence, and if a fibroid which has been found in the course of an abdominal section for some other condition is removed, the patient is almost certain to remark on her subsequently improved feeling of well-being.

Excessive bleeding may be associated with hypertrophy of the ovaries.

It is, however, about the menopause age when the most trying and frequent cases of hemorrhage occur.

(a) In cases of cervical cancer, by the time the growth has developed sufficiently to produce considerable hemorrhage it is practically certain to be too far advanced for radical treatment.

(b) Bland-Sutton has suggested that

uterine fibrosis is the cause of many cases of severe uterine hemorrhage at the menopause, and in a not very large percentage of uteri removed for this condition thick-walled blood-vessels can be demonstrated.

(c) A condition much more frequently found is one which affects chiefly the endometrium, known as hypertrophic glandular endometritis, but the microscope does not usually show the small cell infiltration indicative of inflammation, and it would probably be more correct to regard the condition rather as a degeneration of the endometrium. The uterus is rarely much, if at all, enlarged. It may be retroplaced, but is more frequently in normal position. There is, as a rule, nothing abnormal found about the appendages. After removal the uterine wall is, on section, distinctly pale, but the obviously abnormal condition is an edematous thickened endometrium, usually in places forming one or more mucous polypi from one-fourth to over one inch in length. He has hardly ever seen any blood-clot in the uterus in these cases even when the operation has been undertaken as an emergency for severe active hemorrhage—which points, of course, to a probable deficiency of thrombokinase (blood-clotting substance).

(d) In other cases of irregular menopausal hemorrhage no abnormality is discovered in the uterus, either macroscopically or microscopically.

He thinks there can be little doubt that in all these cases, whether an obvious lesion of the uterine wall or of its lining membrane exists or not, the essential cause of the bleeding is an abnormality in the internal secretions. Some day we may learn how to regulate the functioning of these substances, but until we do Phillips is strongly of the opinion that whenever the bleeding is so severe and so persistent as to make the patient's life a burden to her, the only certain means of curing her is to remove the uterus. Packing the vagina, curettage, ergot and similar drugs are most uncertain remedies and at best produce only temporary improvement. Beyond a doubt the patients who consult their doctors about

bleeding of this sort as a rule never feel well; apart altogether from the hemorrhage there are symptoms, none of them perhaps very bad, but in the aggregate producing a sense of illness enough to make most women willing to risk operation in order to get rid of it, if they are not definitely discouraged by their medical attendant.

The Value of Vaccine Therapy Versus Tonsillectomy in Systemic Disease of Tonsillar Origin.

In the *Medical Record* of February 19, 1921, HAYS, PALMER, and WINSLOW, in a paper on this subject, emphasize the following points:

1. Systemic disease is often of tonsillar origin even when the tonsils are small and show little evidence of disease.
2. Cultures from the tonsils should be taken in all cases of systemic disease.
3. Cultures taken from the tonsils, preferably from the supratonsillar fossa, showing any form of streptococcus, should be considered *prima facie* evidence of tonsillar disease sufficient for their removal, if associated with systemic disease.
4. Tonsillectomy is a better procedure than the administration of vaccines unless operation is contraindicated.
5. A poorly performed operation is no criterion of the value of tonsillectomy. A small piece of tonsil remaining may still keep up the systemic infection.
6. The value of the vaccine as a curative agent is yet to be proved.

Nitrous-oxide-Oxygen Analgesia and Anesthesia in Obstetrics.

In the *Southern California Practitioner* for February, 1921, HASTREITER states that in each individual case the proper mixture must first be ascertained. At the beginning of uterine contractions two to four quick inhalations of the mixture are sufficient to relieve pain.

The patient's color is normal, consciousness is preserved; she can bear down when

directed, and can readily follow every command of the attending obstetrician.

By opening the mouth and breathing through it, any tendency to anesthesia can be averted, should this become imminent.

In case the birth is advancing too rapidly or where relaxation is required, as in the final stage of delivery, a small amount of ether will satisfactorily overcome this difficulty.

Best results will not be obtained unless the gas is administered by a physician familiar with its use. Its efficacy and safety depend wholly upon the skill of administration and a thorough knowledge of its physiological action.

The percentage of oxygen varies largely with the individual and with the conditions presenting themselves from time to time.

Because the margin of working analgesia and anesthesia is so narrow, it is not easy to keep the proportion of gases at the proper point; too much nitrous oxide leading to cyanosis, jactitation, etc., with coincident dangers to the child; too little, and the pain-relieving effect is entirely negatived.

No other agent in anesthesia requires quite as much skill for both safety and efficacy as does nitrous oxide. Over an experience of five years, Hastreiter has found nitrous oxide and oxygen analgesia and anesthesia the most ideal for both mother and child, applicable in the home as well as the hospital; it is within the reach of even those of limited means, and he commends it most heartily to the mature judgment and consideration of the profession.

The Commoner Obstetrical Mistakes.

GAYLER, in the *Journal of the Missouri State Medical Association* for March, 1921, states that the commonest mistake is made by the man who does not see many obstetrical cases. Such a man should not accept an obstetrical case unless he is in the habit of doing obstetrical work and is willing to submit cheerfully to the delays and vexations that come to every obstetrician. The occasional obstetrician often does himself

and the patient an injustice. The practice of obstetrics calls for a large clinical experience and continued practice.

Internal examinations made by a nurse, in order to delay calling the doctor as long as possible, are a grave menace, and must not be tolerated. They are always extremely unfortunate necessities, and their number must be kept down as much as possible.

The use of pituitary preparations has revolutionized the practice of obstetrics, but they have too frequently been improperly used. They must not be used without strict therapeutic indications, and their use as a convenience to the doctor must be prohibited. We still have many normal, spontaneous deliveries that do not need any acceleration, even though it costs the doctor an extra hour or two of his time. While post-mortem hemorrhages seem to have become less frequent, injuries to the cervix have probably become more common since the pituitary extract became popular.

No woman should be permitted to enter labor before the obstetrician has a complete knowledge of (1) the fetal position, (2) the measurement of the bony pelvis, (3) the nature of the soft parts.

(1) A breech presentation can usually be corrected if the condition is recognized and external version attempted some weeks before labor. An impacted, transverse position usually occurs in a neglected woman. (2) Every pelvis should be examined and measured during the first examination, particular attention being paid to the true conjugate diameter. (3) A familiarity with the cervix and vaginal outlet is of importance. The long, narrow, developmentally-deficient cervix dilates slowly and usually tears during delivery. A knowledge of the relaxability of the perineum is very desirable.

The woman who has a narrow pelvis, or other possible obstruction to delivery, is entitled to *early* consultation. The call for help after a long period of labor and after forceps have been attempted is a mistake in technique. It is not at all necessary that every obstetrician be able to do a Cæsarian section, but it is very necessary that he

should know in advance that trouble is coming. A distinctly narrow pelvis calls for early consultation and delivery in a hospital.

The obstetrician should remain in contact with his patient till involution of the genitalia is complete. Six to eight weeks after delivery all patients should be examined to determine (1) if involution is complete; (2) if position of uterus is correct; (3) if all stitches have held; (4) if cervical injury has been severe enough to interfere with function; and (5) to determine the condition of the veins of the genitalia, the anus, and the lower extremities.

Diabetes Insipidus and the Pituitary.

The *British Medical Journal* of February 12, 1921, in an editorial on this subject, says a striking practical outcome of the great volume of physiological, pathological, and clinical work that has accumulated for many years in connection with the pituitary is that after injections of pituitary extract the polyuria of diabetes insipidus of hypophyseal origin disappears for about twelve hours; by repeated injections of the extract the patients can thus be given a respite, particularly at night, from the otherwise constant disturbance involved by the polyuria. This therapeutic effect, first pointed out by Farini in 1913, and copiously illustrated in a paper read last year at New Orleans by Barker, has been thought to rival that of thyroid extract in myxedema, but the effect is not only more transient but much more rapid in its onset; thus, an hour after the administration of 1 Cc. of the extract of the posterior lobe it is impossible to distinguish the urine of a patient with diabetes insipidus from that of a normal person. It is difficult even now to explain satisfactorily the mechanism of this therapeutic success, for the physiological effect of extracts of the posterior lobe and pars intermedia, the cells of which are concerned with the excretion of water, has usually been found to be diuresis; and, conversely, as long ago as 1911 Cushing pointed out the difficulty of harmonizing the

diuresis that may accompany hypopituitarism with the *a priori* expectation that individuals with this glandular insufficiency would show a lowered urinary output.

In a critical review of hypophyseal polyuria, based on 117 cases, of which five are original, Schulmann and Desoutter have gone over the whole subject and comparatively recently Kennaway and Mottram have provided a valuable abstract of the literature. The predominance of males—64 per cent—among the French observers' cases is thought to be possibly due to the influence of syphilis, and cases of cure after antiluetic treatment are given. The usually accepted pituitary origin of diabetes insipidus has been disputed by Camus and Roussy on the grounds that they produced it by puncture of the base of the brain, near the corpora mammillaria, and that pituitary extract has not any specific curative action apart from the fall of blood-pressure and vomiting induced by its sudden entry into the veins. This divergence of opinion is discussed in both the reviews, and Kennaway and Mottram suggest that the polyuria following experimental injury of the base of the brain is due to escape of pituitary secretion into the cerebral substance, there being some evidence that pituitary extract can produce both antidiuretic and diuretic effects from the presence of two substances.

The antidiuretic effect of pituitary extract, thus shown in the treatment of diabetes insipidus, appears to be due to the direct action on the kidney and not to depend on diminished absorption of water from the intestines. In order to obtain this antidiuretic effect the drug should be given hypodermically, administration by the mouth being unsuccessful unless the fresh gland is given in large quantities, ten to twenty times that necessary in hypodermic injection. The French observers tabulate various clinical forms of pituitary polyuria, and in those associated with Fröhlich's adipose-genital syndrome, Dercum's disease, and infantilism, both sets of clinical manifestations were relieved by pituitary injections; they draw a distinction between

pituitary and other forms of polyuria, and state that in the former the renal permeability is normal, except for water, in regard to which it is exaggerated. Failure of response to pituitary medication may be due to the nature of the preparation, the anterior lobe of hypophysis being inert in this respect.

The Cure of Hemorrhoids Without Operation.

In the *British Medical Journal* of February 19, 1921, LYTCH states that there is a means of curing piles, in the sense that they can be made entirely innocuous. It is a question of reducing from a year or two to a month or two the period necessary to change a turgid mucus-covered and tender varix into a skin-covered excrescence and preventing the piles still inside the anus from coming out.

He has seen the application of calomel powder recommended and has tried it. It is useful, but calamine powder is much more so. Calomel, he says, is a trifle irritating, but calamine is soothing and is astringent as well. But the mere instruction to apply calamine will do little good.

Suppose a bad case, with a ring of prolapsed piles surrounding the anus, some perhaps denuded of epithelium, intensely and agonizingly tender, bleeding on defecation, and continually discharging blood-stained mucus, which stains the linen and renders the patient's life a burden. The following plan, he claims, will change the picture:

1. The bowels must be moved the last thing at night before retiring. It may be difficult to alter the usual habit of morning defecation, but it is essential, and can be contrived by suitable aperients.

2. It is hardly necessary to say that the bowels must be moved every night, but a loose action must be avoided. Even a slight degree of constipation, so long as a nightly action of the bowels is secured, while not so good as an easy action, is infinitely preferable to the slightest diarrhea. This means care and discretion in the use of aperients.

3. After the motion, and after gentle

sponging with tepid water, calamine powder is to be applied in the following way: it is to be freely and thickly placed (not merely sprinkled) on a sanitary wool and gauze pad. It is cheap enough, but it need not be wastefully used if care be taken that there is a sufficient quantity (say a couple of teaspoonfuls) on the part of the pad which will exactly remain in contact with the piles when the tapes are tied around the waist. It is necessary that the pad should be pulled firmly up into position.

If there is much discharge the pad should be changed in the morning and fresh calamine applied. If at first there is too much discomfort during the day, it is permissible to substitute ointment—for example, hamamelis—thickly applied on the pad worn during the day. But it must be explained that this is a step which somewhat retards results and does no permanent good. If the patient has the misfortune to have the bowels moved in the morning or during the day he will almost certainly have to be allowed to use ointment on the pad which he then applies, to be changed for the powder at night.

It will be found that after a time, probably not more than a fortnight or three weeks even in the bad case we have supposed, the piles will be sufficiently shrunken and dried and painless by the morning for the daily pad to be dispensed with, unless the misfortune alluded to occurs. Meanwhile, those of the piles normally inside, but which prolapse on defecation, are coming into contact with the calamine before their gradual return during the night, and, subjected to its astringent action, are becoming smaller and less sensitive.

After a further lapse of two or three weeks the patient will find that, although there may be some prolapse of the internal piles on defecation, this is so readily reduced, or reduces itself on attaining the recumbent position, that he can begin to leave off the pad at night, unless he has been either too constipated or too relaxed. He is then in a fair way to being cured. He must always have his bowels moved at night, and he is wise to have calamine and a pad available. In his experience it is

quite futile to attempt to apply the powder in any other way than that described.

The habit of a nocturnal action of the bowels, which allows the immediate assumption for many hours of the recumbent posture, will go far to prevent any further prolapse of such piles as remain inside the anus; and he believes that in this way it will ultimately cause their reduction in size; because it is the persistence of the partial prolapse which normally occurs in defecation which has gone far to bring them to their condition at the beginning of treatment. He assumes that the hemorrhoids are not due to any direct obstruction to the portal circulation or to any local cause such as pregnancy or growth; and that exercise and limited diet will be advised.

With this alternative to operation—an alternative which is inexpensive, which entails no danger, no interference with business, and which is likely to be permanently successful—he thinks he is justified in his heretical proposition that operation is usually unnecessary and rarely justifiable. The remedy is almost as simple as dipping seven times in Jordan; and for that reason, doubtless, there will be those who prefer that the surgeon should “strike his hand over the place” by way of operation. Likewise, there will be the advocates of Abana and Pharpar in the shape of ointments and lotions. None the less, he hopes there will be others who will emulate Naaman and decide to give this method a trial, for he has had such excellent results with it in the past three years that personally he will advise operation only as the last resort.

Swollen Glands and Heart Block in Diphtheria.

In the Correspondence columns of the *British Medical Journal* of February 26, 1921, HARDING, in commenting on this subject, states that most authorities are agreed that it is inadvisable to use hot fomentations to the swollen neck, as they tend to increase the absorption of toxin. When an attack of paroxysmal cardiac failure oc-

curs or is impending atropine hypodermically gives most relief, probably from its effect on the vagal terminals in the heart. It should, he thinks, be given regularly, say every four hours, to all diphtheria patients with a slow pulse (under 50) who are very ill. The foot of the bed should be raised so as to insure the best possible circulation to the vital nerve centers. The best stimulant to use during the attacks is ether given intramuscularly. Personally he avoids strychnine, as he thinks it does more harm than good.

Studies on Hookworm Infection in Brazil.

In a monograph on this subject, published by the *Rockefeller Institute for Medical Research*, February, 1921, DARLING and SMILLIE state that betanaphthol in 18-gm. doses should not be used in the routine treatment of hookworm disease. Hemoglobin determination should be made. A preliminary microscopic examination of the stool need only be made in special instances. Most persons should receive two treatments of oil of chenopodium ten or twelve days apart. The treatment should be as follows:

A light supper but no preliminary purge; 1½ Cc. of oil of chenopodium should be given the following morning in two equally divided doses two hours apart, on a fasting stomach, followed in one and a half to two hours by a saline purge of magnesium sulphate given with at least a glassful of water. When the bowels have acted well the patient may breakfast. This treatment should be repeated in ten days.

In non-malarial communities, if dealing with an individual who has a very low hemoglobin, 60 per cent or less, a third treatment may be given. More than three successive oil of chenopodium treatments need never be administered.

If one is working under ideal conditions, as in a hospital or dispensary, the following more efficient method of oil of chenopodium treatment for hookworm disease is to be recommended:

A preliminary saline purge, 30 gm. of

magnesium sulphate with 300 Cc. of water, is given the evening before treatment. The following morning 2 Cc. of oil of chenopodium is given at 7 A.M. on a fasting stomach, followed by a final saline purge at 9 A.M. with a full glass of water. When the patient's bowels have acted well he may breakfast.

This last method of treatment is slightly more efficient and gives less discomfort than the previous one. It is not practical for field work because of the preliminary purge.

The dosage of oil of chenopodium should never be measured by the drop method. They have experimented with various pipettes and have found that oil of chenopodium may vary between 18 and 70 drops to the cubic centimeter.

Colds and Coughs.

In the *Ohio State Medical Journal* for March, 1921, BOEHMER states that a very satisfactory treatment for an acute cold, where the upper air-passages are involved, a treatment that produces prompt results, is as follows:

A thorough rectal lavage, using plenty of saline solution. Then a very hot bath, having the temperature of the bathroom about one hundred degrees. Remain in tub ten minutes, dry lightly with a coarse towel, retire to a warm bed, previously prepared with hot-water bottles. Give one pint of hot flaxseed tea, containing some lemon and sugar, together with a fifteen-grain dose of urotropine. A sleep with a profuse sweat will follow. On awakening, supply fresh bedding and nightshirt and repeat the dose of urotropine with thirty grains of bromide of sodium. Another sleep will follow, and on awakening the patient's cold is practically aborted. Keep patient in bed another day, giving copious drafts of carbonated water, light food, and another rectal lavage.

All during the time your patient is in bed allow him to inhale mentholated vapor, by sprinkling a little menthol on the surface

of boiling water placed in an ordinary receptacle. Use oil of eucalyptus, or juniper, or turpentine, as the patient prefers. The inhaling of this vapor is particularly soothing and far superior to the use of an atomizer, which latter instrument by the way is usually out of order when one needs it most. Boehmer has no use for the time-honored quinine and active catharsis, which he believes makes the patient more uncomfortable if not actually worse.

Dyspepsia and Malassimilation in Children.

CAMERON in *The Practitioner* for March, 1921, states that primary dyspepsia may be produced by sheer overfeeding, especially by excess of fat or sugar. Often, however, we are driven to the conclusion that the disturbance is dependent upon an individual idiosyncrasy—that in certain children the power of dealing with sugar or starch or fat is, relatively, low and easily overstepped. When the child fails to digest and thrive upon the ordinary milk mixture suitable for his age, that is to say, upon the standard artificial diet of health, the treatment consists in the appropriate modification of the diet in the direction indicated by the symptoms. It is dangerous to make haphazard changes in the hope of finding something which suits. It is not true to maintain, as he sometimes sees maintained, that some one particular form of diet—whole milk, for instance, or some one of the many proprietary foods—has the power to confer health upon all ailing babies in difficulty with their digestions.

Of the several forms of primary indigestion and malassimilation in infancy, he takes one only and deals with it in detail.

Very commonly we meet with infants who suffer from constipation and whose stools, instead of being soft and yellow, are hard, formed, and pale. Often they have the color and consistency of putty. These scybalous stools are apt to be passed with great difficulty, and with much straining. Sometimes we find upon them a streak of

blood from laceration of the delicate mucous membrane in their difficult delivery. Stools of this nature are only exceptionally seen in breast-fed infants. In infants fed upon mixtures in which cow's milk predominates, whether the milk be fresh or desiccated, they are much more common. The formation of stools of this nature is favored by the high protein and fat content of cow's milk and its relatively low percentage of fermentable sugar, but they are not always prevented even by careful modification of cow's milk so that the percentages of sugar, fat and protein are the same as in human milk. The disturbance is apt to occur in infants in convalescence from severe infective disorders which have greatly affected nutrition, and after those attacks of fermentative dyspepsia with acid-green stools, which occur so often in times of great heat.

The stools consist largely of soaps. The fatty acids, derived chiefly from the splitting of the fats of the food, have combined with the calcium and magnesium salts to form these masses of alkaline soaps.

Bacteriologically we find a great decrease in all the Gram-positive bacteria which are so prominent in the stool of the normal breast-fed infant, and which thrive in an acid medium and are active in producing fermentative changes in the bowel. There is a corresponding increase in the alkali-loving proteolytic and putrefactive, Gram-negative bacteria which produce indol, skatol, phenol, etc. In consequence we find that these formed stools have commonly a foul odor, sometimes cheesy, sometimes fecal in character. The remaining symptoms, characteristic of the disturbance, may be grouped as follows:

The weight-curve shows no steady rise. Comparatively large gains in one week may be succeeded by an equally great fall in the next. This zig-zag course is even more strikingly apparent when the weights are recorded each day. At six months the infant may weigh little more than the birth-weight.

The temperature is persistently subnormal, or it shows an irregularity, rising at times to the normal line or even above it, but with subnormal registers predominating. The monothermia of the healthy baby, a delicate index of its well-being, is absent.

Though the weight-curve is so unsatisfactory, the infant is not emaciated. The skin is not dry, nor does it hang in folds. But the child is small, flabby, pale, and inert, with a somewhat prominent abdomen. Often there is a complete absence of fretfulness, and the child may be observant and attentive.

Very large quantities of urine are passed. Indicanuria is often strongly marked. The urine smells strongly of ammonia, and may be very irritating to the child's skin.

Vomiting is a variable symptom. It commonly occurs at a long interval after the feed has been given, and smells strongly of volatile fatty acids.

This type of malnutrition and indigestion, characterized by an excess of the putrefactive and a diminution of the fermentative processes of the bowel, is in general very readily controlled by a diet modified so as to keep the fat and protein at a low level, while fermenting carbohydrate is given freely.

For this purpose, Cameron makes use of the following recipe (Keller's modification of Liebig's original formula), which is suitable for infants over three months of age. Four teaspoonfuls of baked flour are rubbed into a paste with a little milk. With constant stirring, more milk is added up to 12 ounces. The mixture is then strained through a sieve. In another vessel 10 teaspoonfuls of extract of malt are dissolved in 24 ounces of lukewarm water, with 20 grains of carbonate of soda. The contents of the two vessels are then mixed, and very slowly, with constant stirring, brought to the boil and kept boiling for two minutes.

The stools commonly show a rapid improvement, and within a few weeks the whole appearance of the child is altered for the better. After six weeks or two

months the ordinary milk mixtures may be resumed and will generally be well tolerated.

In the case of infants younger than three months, or as an alternative method, we may make use of buttermilk with a high percentage of added lactose. If fresh buttermilk is not obtainable, a fresh lactic acid culture in skim-milk may take its place.

In a few cases of great chronicity and severity, any attempt to restore the usual milk mixtures, with their relatively high fat content, brings about a return of the disturbance. In such cases, butter-fat which has been subjected to a certain amount of cooking may be better tolerated than cream or milk with a high percentage of fat. He uses the following recipe: Heat $\frac{1}{4}$ ounce of butter until it melts and begins to simmer. Add one teaspoonful of baked flour and, stirring continuously, heat it until a light-brown color begins to appear. Add 3 ounces of water and a small teaspoonful of sugar and bring to the boil.

This mixture may be used with equal parts of milk in cases of persistent intolerance for milk.

Swelling of the Pinna—An Early Sign of Deficient Antiscorbutic Vitamine.

In *The Practitioner* for March, 1921, SHEASBY states that during the early summer of 1918 swellings of one or both ears began to appear amongst the occupants of a group of internment camps in England. At first the swellings were diagnosed as infective cellulitis, and one or two of the earlier cases were incised, but no pus was found, and the condition persisted in spite of the usual treatment for cellulitis. As more cases occurred, further inquiry was made, which showed that the sign was due to a mild degree of scurvy. About thirty cases were noted; twenty of these occurred in a compound adjoining a group of similar compounds occupied by officer prisoners, amongst whom there were no cases. The remaining ten cases were distributed

as follows: eight in a hutment compound, and two in a canvas camp.

Most of the men made no complaint of anything beyond the swelling of the ear, which they said was not due to any injury. In fact, in no case was any history of direct traumatism obtainable. In twenty-four of the cases one ear only was affected; in the remainder the other ear was also involved, to a greater or less extent. In most of the cases the swelling occupied the upper half of the left pinna. The skin of the affected ear was reddened, and there was very slight pitting on pressure; no blood-staining was visible, and only very slight tenderness on manipulation. In a few cases the swelling had extended into the subcutaneous tissues of the scalp and pushed the ear slightly downward and forward. No involvement of the gums or ecchymoses could be detected, and beyond slight weakness and pallor no other sign of scurvy could be made out.

The dietary as supplied to these troops contained ample antiscorbutic accessory factor, but during the process of cooking much of this was destroyed.

The articles of food—fresh meat, vegetables, and potatoes—containing antiscorbutic vitamine were always served in the form of a stew, the whole being slowly cooked in a large boiler for a period of four or five hours. Immediately before the outbreak fresh vegetables were scarce, and no potatoes had been obtainable nor issued for a fortnight.

On steps being taken to have the vegetables and potatoes cooked separately and not stewed with the meat, the symptoms described disappeared, and no further cases occurred.

There is no doubt that owing to the method of cooking prevailing in these camps the occupants were suffering from deficiency of antiscorbutic substances, and that the mild manifestations of scurvy described were precipitated by the complete absence of potatoes from the dietary for a fortnight.

The position of the swellings on the ears rather than at any other part may be accounted for by the fact that the men were sleeping on hard pillows, which gave rise to more irritation there than any to which other parts of the body were exposed.

Mucous Colitis.

In the *Virginia Medical Monthly* for March, 1921, HAMNER states that in determining the treatment of this condition two facts stand out prominently: (1) that retained mucus is harmful mucus, and (2) that the cure requires a long course of treatment. He endeavors to impress on his patients that they cannot expect any magical improvement, and that without their coöperation, combined with patience and persistence, he can accomplish nothing toward relieving them.

He considers the daily colonic lavage with a solution of sprudel salts the treatment *par excellence* for removing the mucus and relieving the toxemia. This may be supplemented as occasion requires by large doses of castor oil by mouth to facilitate the passage of the mucus. The enemas should be taken with the patient on the left side and hips elevated slightly higher than the shoulders, and the solution should be as hot as can be comfortably borne.

Recently, transduodenal lavage with a 4-per-cent sodium sulphate solution has been used with reported cases. He has not used it for this purpose.

There should be insistence on regularity of bowel movements, but restriction of the use of enemas and colon irrigations. It is easy for the patient to acquire the habit of using these two or three times a day, if permitted to do so. The diet must be ample, but the use of bran, coarse foods, and too much fruit should be discouraged in the beginning as they may do more harm than good and undoubtedly more harm than a mild tonic laxative. The best of laxatives is usually a softening and bulk-producing agent, such as liquid petrolatum, cascara agar, phenolphthalein agar, or

small doses of some form of magnesia. If these are not effective they may be supplemented by one of the tonic laxatives, cascara, rhubarb, aloes, senna, or senna with sulphur in the form of compound licorice powder (the latter is a favorite with him). A valuable measure also is the retention over night of from four to sixteen ounces of cottonseed or olive oil. In these chronic cases the drastic cathartics may be successful in removing mucus, but should be employed only seldom. If after a long and faithful trial such measures as these do not overcome the stasis and the toxemia, the question of surgery should be seriously considered. The numerous surgical procedures for this trouble have no place in his paper. Hemorrhoids are a bad complication, as they prevent the use of irrigations, enemas, or such strong cathartics as castor oil. They may be treated by the nightly instillation into the rectum, by means of a soft-rubber ear syringe, of 60 Cc. of warm olive oil or cottonseed oil to be retained over night, but only until the patient is able to have them removed surgically.

The diet may have to be modified to suit the specific cases and according to the condition of the stomach and upper bowel (achylia, hyperchlorhydria, gastric atony, etc.), and to overlook these is to fail in the treatment; but in general, at the outset, the diet should be of the bland, lactofarinaceous type.

Of course, if there exists any definite surgical condition in the abdomen, such as appendicitis, cholelithiasis, adhesions, bands, or pelvic disturbances, it should be overcome.

Occupation, recreation, and rest in proper proportion should be advised. The patients should not be allowed to coddle themselves. They should get up before breakfast and not lie in bed late in the morning; they should, however, recline at a later hour in the day, when this is possible, perhaps best for one or two hours after the midday meal, and they should retire early. They should give less time than usual to the responsibilities of social or business life, or give

them up for a time entirely, and they should not receive too many visitors. Introspection should be strongly discouraged at all times. And one of the greatest helps in the treatment is a change of scene, to get away from oversolicitous or nagging friends, or from the monotonous routine of home life or business.

Hamner says he was a physician of deep perception who replied to the inquiries of the overanxious wife: "Madam, your husband needs a rest. One of you must take a vacation."

For the treatment of attacks of colic Hamner advises rest in bed, large dose of bromide, $\frac{1}{2}$ to 1 drachm, a hypodermic injection of atropine, a hot-water bag, electric pad stupes to the abdomen. Morphine is to be used very carefully on account of habit. A large dose of castor oil and colon irrigations with warm soda solution are often useful.

Irritants such as silver nitrate should not be employed, in his opinion. Combination of castor oil by mouth, codeine and atropine hypodermically, and colonic lavage will be followed often by relief and sleep. If this does not give relief, a good plan is to put the patient into the knee-chest position and inject slowly into the colon from one-half to one pint of warm olive oil or cotton-seed oil, to be retained over night, or as long as possible. The injection is often followed by the passage a few hours later of the oil and an abundance of mucus, with the disappearance of the colic.

Treatment in Botulism.

In the *Archives of Internal Medicine* for March, 1921, BURKE, ELDER and PISCHEL, in their conclusions, state:

Spoiled foods containing gas may appear to be boiling for several minutes before the true boiling point is reached. They recommend that all suspected food be subjected to vigorous boiling for at least thirty minutes before being tasted.

Spoiled canned foods giving the appearance of boiling for seven minutes and sub-

jected to actual boiling for four minutes are not safe to eat. Spoiled canned foods exposed to a temperature of 80° C. for one hour may appear to be boiling part of the time and not be safe to eat.

We may expect to have outbreaks of botulism following the eating of insufficiently cooked spoiled foods.

The heat resistance of the disease-producing power of different kinds of spoiled canned foods containing *C. botulinum* and its toxin has not been determined and probably will be found to vary.

There have been no recorded outbreaks of botulism in this country without a history of preserved foods having been eaten.

There is no evidence that infection in man ever follows the ingestion of toxin-free organisms of *C. botulinum*.

There is no evidence that infection in man ever follows the ingestion of the toxin and organisms of *C. botulinum*.

Botulism does not result from the ingestion of small numbers of toxin-free spores.

The disease-producing power of an old can of spoiled beans containing *C. botulinum* and its toxin can be destroyed by an exposure to temperatures that rarely if ever destroy the spores of *C. botulinum*.

Rabbits can be saved from the effects of feeding 2 M.L.D. of a toxic culture of *C. botulinum* by the intravenous injection of the homologous antitoxin as soon as the symptoms appear. Such rabbits cannot be saved if the antitoxin treatment is delayed until the symptoms are well advanced.

In outbreaks of botulism, as soon as the first case develops, a polyvalent immune serum should be injected intravenously in all those who have partaken of the suspected meal. This treatment should materially decrease the death-rate.

The contents of a full normal rabbit stomach does not neutralize the toxin of *C. botulinum*, but it apparently reduces the action of the toxin to some extent by slowing down or preventing its absorption.

Fats and oils do not neutralize the toxin of *C. botulinum*.

Fats and oils will protect against the

action of the toxin of *C. botulinum* when the toxin and fat or oil are emulsified and injected subcutaneously into guinea-pigs. This protection is very limited and varies with the degree of the emulsion and the type of fat. The protection is due to a slowing down of the rate of absorption of the toxin.

Olive oil will delay the action of the toxin in the stomach of a rabbit when force-fed immediately after the toxin and at repeated intervals. It apparently affords no greater protection than milk.

Certain food substances, such as glucose, brain tissue, milk, eggs, and gelatin, do not neutralize the toxin of *C. botulinum* and do not protect as effectively as olive oil against the action of the toxin in subcutaneous injections.

Apple vinegar, giving a positive test for alcohol, protects against the action of the toxin of *C. botulinum* when the two are mixed, incubated two hours and injected subcutaneously into guinea-pigs.

The protection afforded by the vinegar is not due to necrosis of the tissues, since vinegar neutralized with sodium hydroxide does not cause necrosis, and still protects against the action of the toxin. The protection afforded by the vinegar may be due to the alcohol present. Acetic acid and sodium acetate do not neutralize the toxin of *C. botulinum*.

Vinegar when force-fed immediately after a toxin filtrate and at repeated intervals afforded some protection against the action of the toxin in the stomach of the rabbit.

Sodium hydroxide, potassium permanganate and liquid soap have a neutralizing action on the toxin of *C. botulinum*.

Adrenalin chloride has a slight neutralizing action on the toxin of *C. botulinum*.

Iodine and iodine to which sufficient starch has been added to prevent necrosis of the tissues have a strong neutralizing action on the toxin of *C. botulinum*. Potassium iodide does not neutralize the toxin of *C. botulinum*. In *in vivo* experiments, iodine injected on the opposite side of the body

from the toxin afforded no protection. Gram's solution affords some protection against the action of the toxin in the stomach of the rabbit when force-fed immediately after the toxin.

The treatment of botulism is in the experimental stage, and based mainly on insufficient or inexact knowledge. In experimental work with laboratory animals and in the treatment of human cases of botulism there has not been gained sufficient knowledge to develop a scientific treatment. This can be explained partly on the grounds that it is only within the past few years that the attention of the investigators has been drawn to the subject of botulism, and partly to the fact that we are dealing with a powerful and rapidly acting toxin. However, they have reasons to believe that when further experimental work has been done, and physicians become better acquainted with the disease, a treatment will be developed that will materially lessen the death-rate.

The treatment of botulism may be classed as specific and general. By specific treatment is meant the use of an immune serum which neutralizes the specific toxin of *C. botulinum*. Since there are at least two distinct toxins, and there is no rapid means of determining the type, it is necessary to use a polyvalent antitoxin or a Type A and a Type B antitoxin. And since there is a possibility that *C. botulinum* occasionally produces its toxin in the body, the immune serum should be bacteriolytic or bactericidal as well as antitoxic. The serum should be injected intravenously.

The immune serum to be beneficial must be used as soon as possible after the diagnosis is made. In all cases of doubtful diagnosis, all of those having partaken of the suspected meal should receive immediate antitoxin treatment. The antitoxin can only neutralize the toxin and prevent further injury. It is of no value to the already damaged nervous system. The evidence that they have indicates that treatment begun after the symptoms are well advanced will not, in most cases, alter the

course of the disease. But these investigators have sufficient experimental evidence to believe that some of those receiving lethal amounts of toxin can be saved by the use of antitoxin if the treatment is begun at about or before the time the symptoms appear.

The general treatment of botulism consists of treatment of the digestive tract and stimulation of the nervous system. Botulinus toxin is a true toxin and differs from the toxins of diphtheria and tetanus in that it is, so far as is known, taken into and possibly produced in the digestive tract and is not altered by the gastric juice. This gives an opportunity to develop a treatment directed against the toxin in the digestive tract as well as in the blood stream.

Treatment of the digestive tract in cases of botulism has been designed to prevent the further absorption of the toxin by its removal, stimulation of gastric secretions, the use of demulcents and oils. A method of neutralizing the toxin in the digestive tract should also be developed.

Treatment of the intestinal tract in cases of botulism cannot be placed on a scientific basis until we know the effect of the intestinal contents on the toxin. Graham has shown that the droppings of chickens suffering from botulism and also droppings found in forage causing botulism when ground up and fed to horses cause death. He apparently assumes that the toxin passed through the intestinal tract of the chickens, and that the horses died as the result of the ingestion of this toxin rather than from the production of toxin in the digestive tract following the ingestion of toxin-free organisms. Forssman has shown that the injection of 2000 lethal doses of toxin in the rabbit intestine does not cause death. He believed that the intestinal contents of the rabbit precipitated the toxin. Until we know whether or not the toxin in the intestinal tract is harmful we must proceed upon the assumption that it is and take steps for its removal, neutralization, and the prevention of absorption.

Burke and his colleagues recommend the use of high enemas that will neutralize the toxin, prevent its absorption, and destroy the organisms. They have shown that some of the common ingredients of enemas should be beneficial. Liquid soap neutralizes the toxin, olive oil prevents its absorption, and turpentine may have some beneficial action. Iodine and potassium permanganate destroy both the toxin and organisms and might be used to advantage. The effect of soap on the organism is unknown and should be determined. If it can be shown that the toxin in the intestinal tract is harmless and is not produced there, the use of enemas can be restricted to feeding and the control of constipation.

In those patients in whom the symptoms do not appear for several days after the ingestion of the toxic food, we may reasonably assume that there is very little, if any, of the ingested toxin remaining in the digestive tract. But since there is a possibility of infection and production of toxin in the digestive tract, it is necessary to proceed on the assumption that toxin is always present in the stomach of any one suffering from botulism. When the symptoms appear in a few hours after the ingestion of the poisonous food we should expect to find toxin in the stomach. In these cases paralysis of the stomach apparently sets in early. Case reports show that toxin has been found in the stomach several days after the ingestion of the toxic food.

Treatment of the stomach should have in mind the removal of the toxic contents by stimulation of movement or the stomach pump, the prevention of absorption by the use of demulcents and oils or stimulation of secretions, the neutralization of the toxin, and the destruction of the organisms. The removal of the stomach contents is attended with some danger, as it may induce pneumonia. The death-rate among those vomiting is 75 per cent; among those not vomiting, 70 per cent. The average time of death of those vomiting is 3.7 days and of those not vomiting 5 days after the ingestion of the toxic food. This indicates that

those ingesting the most toxin tend to vomit or the act of vomiting induces a terminal pneumonia.

In their experimental work they have shown that the food taken in with the toxin delays the appearance of the symptoms. This is probably due to a slowing down of the rate of absorption of the toxin. Their work has also shown that a slowing down of the rate of absorption enables a guinea-pig to resist three lethal doses of toxin. The use of oils, milk and alcohol slowed down the action of the toxin in the stomach of the rabbit. Iodine, potassium permanganate and liquid soap have a strong neutralizing action on the toxin, but it has not been determined whether they can safely be used in the stomach in large enough amounts to be beneficial.

Treatment of the stomach must be begun early, as paralysis of the throat soon sets in and there is great danger of pneumonia. Most of their rabbits dying after the fourth day showed gray hepatization of the lungs. A non-irritating gargle of 2-per-cent argyrol may be used as a precautionary measure.

Pilocarpine has been used to remove the tenacious mucus usually found in the throat in advanced cases. It "should be used with caution; as the patient is unable to cough up fluid from the lungs if pulmonary edema is induced."

Treatment of the nervous system must be general until we know what nerves or nerve centers are affected. Strychnine has been used in most cases.

We cannot hope for a more satisfactory treatment until our knowledge of the subject becomes more exact. With our present knowledge of botulism, the death-rate should be reduced when antitoxin becomes more available and the symptoms more readily recognized.

From an examination of the incomplete statistical data they obtain certain facts which have a bearing on the prognosis. The death-rate in this country varies from 60 to 70 per cent. The death-rate among those first showing symptoms in all outbreaks in

this country is 90 per cent, among those last showing symptoms 60 per cent. The death-rate of those vomiting is 75 per cent. Vomiting cannot be considered a favorable sign. The death-rate of those showing symptoms in twenty-four hours after the ingestion of the toxic food is 84 per cent; of those showing symptoms for the first time after seventy-two hours it is 55 per cent; and of those alive after the eighth day it is 20 per cent.

Exophthalmic Goitre and Surgery.

In the *New York Medical Journal* of February 19, 1921, BRAM states that surgery is indicated in Graves's disease when:

1. Marked pressure symptoms of cervical and thoracic structures are evident.

2. Malignant degeneration of the thyroid occurs. (Marked pressure symptoms and malignancy are unusual occurrences during the course of thyroid hyperplasia.)

3. A local structure (tonsils, appendix, pelvic abnormalities) which, by a careful process of exclusion, is found to have an etiological bearing on the syndrome. Surgical removal of such diseased tissues, in breaking the continuity of the vicious circles upon which the symptom-complex depends, may bring about a cure.

Surgery is contraindicated in the vast majority of cases of Graves's disease, for,

1. The pathogenesis of the disease points to the thyroid as playing but a small part in the causation of the syndrome.

2. The symptomatology of the affection is as wide-spread as the body itself, favoring strongly the pluriglandular theory.

3. Physiology indicates that, in the human being, it is almost as dangerous to attack surgically an overactive vital organ, such as the thyroid, as to attack surgically an overactive heart.

4. On clinical grounds, Graves's disease does not fall in the realm of surgery, as indicated by the considerable mortality rate, frequent operative accidents (*e.g.*, myxedema, tetany, vocal paralysis), postoperative sequelæ (acute exacerbations, acute

psychoses), recurrences, and the lack of conclusive proof of complete surgical cures. As has been suggested, surgical interference with the thyroid, by reducing the recuperative powers of the patient, prolongs the state of invalidism and favors profound degenerative changes of the tissues of the circulatory and nervous systems, rendering the prognosis less favorable and the task of the internist tedious.

5. On empirical grounds, Graves's disease belongs strictly in the field of the internist who, having made endocrinology his field of special endeavor, is capable of demonstrating complete and permanent non-surgical cure of every case of the disease in which the vital structures are not badly damaged and a reasonable degree of co-operation is obtainable.

Cerebrospinal Fluid in Treated Syphilis.

In the *Journal of the American Medical Association* of March 19, 1921, MOORE, in summarizing his article on this subject, states:

1. The cerebrospinal fluid of 642 syphilitic patients in all stages of the disease, but without demonstrable physical evidence of neurosyphilis of any type, has been examined after the administration of from two to six months of antisyphilitic treatment.

2. Of thirty-four patients with primary syphilis in whom treatment was begun before the appearance of secondary symptoms, only one (2.9 per cent) showed an abnormal spinal fluid.

3. After the appearance of secondary symptoms, the incidence of abnormal spinal fluid findings was about the same (from 12 to 15 per cent), no matter how long the disease had existed, or by what lesions it was apparent.

4. Only 12.7 per cent of these 642 patients showed spinal fluid abnormalities, showing that the amount of treatment administered had been successful in clearing up at least half of the early changes noted by other workers in untreated cases.

5. Asymptomatic neurosyphilis is ap-

proximately twice as frequent in white as in colored patients.

6. As minor signs of value in predicting the probability of neurosyphilis are a persistently positive blood Wassermann reaction after treatment, slight pupillary abnormalities, and certain complaints of the patient, namely, headache, nervousness, lassitude, and generalized neuralgic pains. Of 173 patients who showed such signs, the spinal fluid was abnormal in forty-nine, or 28.3 per cent. On the other hand, of 469 patients in whom neither these nor other more serious neurologic damage was demonstrable, only thirty-three, or 7.03 per cent, showed abnormal spinal fluids.

7. In general, the serologic evidence of asymptomatic neurosyphilis can be caused to disappear by prolonged, intensive, routine antisyphilitic treatment.

8. In the Syphilis Department of the Johns Hopkins Hospital, more than 20 per cent of all patients are clinically, or because of their serologic evidence, potentially outspoken neurosyphilitics.

Study of the spinal fluid should be carried out as a routine in all syphilitic patients, as an essential to intelligent treatment. Spinal puncture should be performed after the first or second course of arsphenamine, and should be repeated at least once before the patient is discharged as presumably cured.

If this is done in every case of syphilis, and treatment intelligently administered according to the results obtained, the incidence of clinical neurosyphilis may be reduced to an absolute minimum.

The Selection of Donors for Skin Grafting.

In *The Practitioner* for March, 1921, JONES states it is interesting to note that it has been shown by Shawan that, in heterogeneous skin grafting, the grafts must be taken from some one of the same blood group as the recipient or from a Type IV group.

The Treatment of Syphilis.

In the *British Medical Journal* of March 19, 1921, MACCORMAC and KENNAWAY state that the following general conclusion may be drawn in respect to old-standing types of this disease. Although the symptoms which the patient presents may be relieved, treatment fails to influence the Wassermann reaction permanently. It is true that by prolonging the treatment over several years a negative Wassermann reaction may be sometimes brought about; but in their experience such an effect is not lasting.

Although it is not strictly within the scope of this paper, treatment is so intimately connected with diagnosis that some reference to the interpretation of the Wassermann reaction may be appropriate. It is becoming more and more common for patients to be referred by practitioners, or to come voluntarily, for a "blood test." Even the evidence of a single negative Wassermann reaction is sometimes accepted as conclusive. But the Wassermann reaction is only one of the factors upon which diagnosis should be based. In all forms of syphilis, including the secondary, a negative Wassermann reaction may be met with. Nor is there anything in the nature of syphilis to prevent the person infected with it and having a positive Wassermann reaction from developing some other disorder—for example, psoriasis or scabies. Hence, if the syphilitic nature of any lesion of the skin or elsewhere be concluded or excluded solely on the result of a "blood test" many mistakes will be made. This consideration is not purely academic. Examples of error arising in this way have frequently come under observation. Nor should the statement that treatment has an effect on the Wassermann reaction be allowed to pass unchallenged. Treatment has an effect upon the disease, and this is shown in the primary and secondary stages by the changing character of the reaction. In the later stages, on the other hand, treatment may alleviate or remove symptoms, but in the great majority of cases it does not cure the disease, and therefore fails to influence the reaction.

What is the meaning of such persistent positive Wassermann reactions? Are they merely the result of some habit of the tissues acquired as the result of previous infection? They believe that this is not the case, but that they indicate the presence of spirochetes. The best evidence for this belief is obtained from consideration of gummatous conditions of the skin. They know that treatment causes gummata to disappear, but they also know that the chance of subsequent relapse is considerable. But gummata are the consequence of local spirochetosis. Here, then, the persistent Wassermann reaction is clearly associated with the continued presence of spirochetes. In the case of disease of the skin the evidence is more obvious, because we can actually observe what happens, but consideration of facts goes to show that the above statement is equally applicable to old-standing disease of other parts of the body. The spirochetes have acquired some property enabling them to withstand remedies capable of destroying them at an earlier period of infection. This indifference of chronic infection to remedy is common to infective processes in general, and in this syphilis only obeys a recognized pathological law.

Syphilis is but one process, whether it involves skin, mucous membrane, nerve, or other tissue, and the phenomena which go to make different diseases are largely the result of mechanical interference with function. The principles upon which treatment is based vary in accordance with the duration of infection. When infection is recent—that is, in primary and secondary syphilis—two objects are in view: cure of disease and prevention of communication to others, for at this period the disease is contagious. Therefore a severe and lengthy course of treatment should be undertaken. On the other hand, in old-standing disease only symptoms are treated, because the disease is now very difficult to cure and is no longer communicable. Therefore, the form of treatment may be shorter, and repeated from time to time as circumstances demand.

In forming a comparative estimate of the

value of arsphenamine and mercury certain considerations should be borne in mind. In the early stages arsphenamine should be used to bring the disease within the scope of mercury, which finishes the cure. Arsphenamine rapidly brings about the negative phase, which is maintained by mercury. This may be interpreted as follows: Arsphenamine destroys the majority of, sometimes all, the spirochetes, and mercury kills any which may have chanced to escape. But the amount of arsphenamine must be adequate. As is shown in a table, six injections are often insufficient. Nor are small doses satisfactory; not only is the favorable effect on the Wassermann reaction often wanting under their use, but when they are employed the clinical manifestations after a period of improvement may become active again, even under treatment. The "ten" series seems largely free from these objections, and although lesser amounts have succeeded in many cases, the standard of treatment should depend upon what the average, not the favorable exception, requires.

In primary and secondary stages, then, treatment should commence with the series of ten intravenous injections of neoarsphenamine already outlined. There appears to be an advantage in giving mercury at the same time, but the evidence in favor of this is not conclusive. On the other hand, if mercury be withheld during the period of arsenical medication, opportunity is afforded for improving the condition of the teeth and mouth and thereby diminishing the chance of subsequent mercurial gingivitis, a point of practical importance, since such an occurrence may seriously interfere with subsequent treatment.

When the arsphenamine course is concluded mercury is administered by the intramuscular route for three months. The condition of the Wassermann reaction is then determined. If positive, the course is repeated from the beginning. If negative, mercury, either in the form of injections or pills, is continued until two years have been completed from the commencement

of treatment with suitable rests, the Wassermann reaction being investigated every three months.

Such a course is doubtless severe and prolonged. But with ordinary care and modification, if any condition demanding this arises, it can be carried out without harming or even inconveniencing the patient. When the serious results of failure are put in the balance against it, it would appear to be entirely justified. Nor should the consequence of delaying cure be forgotten. As time passes the disease becomes more fixed; therefore, if failure result from any form of treatment, the time that has passed in carrying this out may have allowed the disease to merge into an incurable state.

In the late stages in their series ten intravenous injections of neoarsphenamine and then three months' intramuscular mercury were given. What may subsequently be done depends upon the clinical progress of the case. In this connection it should be remembered that in disease of the nervous system there is often a considerable latent period, up to three or four months, before improvement becomes evident. Repetition of this course is generally necessary, and this would be expected from what has already been said in reference to the Wassermann reaction.

Finally, it may be added that even in late stages of the disease active forms of medication, such as arsphenamine or mercury by inunction or injection, are preferable to other methods.

Diabetes Insipidus as a Hypopituitary Syndrome.

In *Endocrinology* for March, 1921, MARAÑÓN states that clinical experience overwhelmingly demonstrates that diabetes insipidus is, almost without exception, connected with a disturbance of the hypophysis; and more exactly, to a disturbance of the posterior lobe of the hypofunctional type. It is very important to note that the majority of his cases (and the same thing

occurs with those published by other authors) were absolutely opposed to the hypothesis that it is a matter of tumors of the gland which, by secondary pressure on the neighboring nervous centers, and not by an endocrine disturbance, produce the polyuria; since in nearly all cases the lesions were not tumors but were sclerosis, atrophy, hemorrhage, etc., as was proved by the clinical and radiographic examination.

Great value is also attached in this regard to the favorable result of hypophyseal opotherapy. He does not understand how one can doubt the biological significance of the fact that the injection of the extract of the organ which the clinical and post-mortem examination shows to be diseased in diabetes insipidus is the only therapeutic means, among so many which have been used through the ages, which in a certain and safe manner suppresses the polyuria. One cannot suppose that it is a question of a general action of these extracts, as other polyurias, such as that of chronic nephritis or that of diabetes mellitus, are not influenced by pituitrin, or are influenced to a very slight degree, as he has proved repeatedly. In consequence of the combined evidence of the curing of the polyuria of diabetes insipidus and not the other polyurias, and the efficacy of the extract being precisely that of the gland which is found to have a lesion in this disease, and no other extract or inorganic substance whatever having a like effect, he thinks one can assert, with Hoppe-Seyler, that the curative action of pituitrin in diabetes insipidus has the same value as that of thyroidin in myxedema; that is to say, that even in the absence of other clinical symptoms it is sufficient that the polyuria diminishes or disappears after the injection of the drug for one to decide upon the hypophyseal origin of the disease.

A very interesting fact to which some authors have called attention, but which he thinks has not been sufficiently emphasized, is that pituitrin, used in the same dose for different cases (0.5 or 1 Cc. of the com-

mmercial solution), produces in various patients a different effect, inversely proportional to the intensity of the polyuria. That is to say, that in patients with much polyuria the effect is greater than in those with less polyuria; and in both the former and the latter, whatever the dose given, the quantity of urine is never less approximately than normal. For example, 1 Cc. of pituitrin lowered the quantity of urine in one case from 12,000 Cc. to 1900 Cc.; two other cases from 9000 Cc. to 2000 Cc.; in another case from 9600 Cc. to 1300 Cc.; while in still another the diminution was only from 3500 Cc. to 1600 Cc. In two additional cases from 4000 Cc. to 1700 Cc., and from 4100 Cc. to 2000 Cc. In no case was the reduction less than 1500 Cc. It appears, then, that pituitrin is only able to act on pathological polyuria, by reducing it to normal, but without reducing it below this limit. This effect is obtained almost equally with a dose of 0.5 Cc. as with 1 Cc. of the commercial pituitrin. Doses greater than 1 Cc. do not increase the oliguric capacity of the drug.

Personal Precautions Against Encephalitis Lethargica.

The *Lancet* of March 12, 1921, in an editorial on this subject, states that the memorandum on encephalitis lethargica issued by the Ministry of Health concludes with a clear statement of the precautions which it is advisable for the individual to take against infection:

The other occupants of a house in which a case of encephalitis has occurred, or is being treated, may be assured that the disease is one of low infectivity, and that very little risk is run by association with the patient. At the same time it is desirable that such association should be limited to what is necessary for proper care and nursing, and the patient should be well isolated in a separate room.

Schoolchildren in the affected household may be kept from school, as a precautionary measure, for three weeks after the

isolation of the patient. There is no necessity to place restriction on the movements of other occupants provided they are frequently examined and remain well. Those in contact with the case, however, should be advised to use antiseptic nasal sprays or douches, and to gargle the throat with solutions such as those advised for influenza.

For example, any of the following may be used: (1) One-per-cent solution of peroxide of hydrogen; (2) a solution of permanganate of potash, 1 in 5000, in 0.8-per-cent solution of chloride of sodium (common salt); (3) liquor sodæ chlorinatæ, 0.5 per cent. These solutions can be used as ordinary throat gargles or snuffed up the nostrils, or applied by an efficient spray.

It is desirable that any persons in the infected household who suffer from sore-throat or other symptoms suggesting an abortive attack should be treated from this point of view and isolated as far as possible until they have recovered. The sick-room should be thoroughly cleansed and disinfected at the end of the illness.

Magnesium Sulphate in Arsenic Poisoning.

In the *Journal of Pharmacology and Experimental Therapeutics* for March, 1921, HANSEN states that although the evidence points toward a prolongation of life by magnesium sulphate, the antidote is so toxic in itself and the poison so variable in its effect that it is impossible to say conclusively whether death in a given case is due to poison or to antidote. Further work must be done to find a compound of magnesium less toxic than the sulphate, which will have the antagonistic effect toward arsenic without the danger to the animal. Investigations are now being carried out with magnesium benzoate, with some promises of good results, but not enough material has been gathered for a report. The time of giving the magnesium in relation to the administration of the arsenic may be a factor to consider, though so far

whether it was given one-half hour before or a few minutes later has apparently made no difference in results.

Definite conclusions cannot be drawn in regard to the action of magnesium sulphate in arsenic poisoning, but results may be summarized as follows:

1. Magnesium sulphate has prolonged the average life of a series of fifty rabbits poisoned by arsenic from 219 hours to 415 hours on the average, but cannot be said to have saved life in rabbits.

2. Magnesium sulphate is toxic in large doses and to some extent in medium-sized doses.

3. There is a marked variation of individual susceptibility to arsenic poisoning.

Treatment of Sprue by Massive Doses of Sodium Bicarbonate.

In the *British Medical Journal* of March 5, 1921, CASTELLANI states that in carrying out certain researches on sprue he noticed that to render strongly alkaline the urine of patients suffering from this malady it was necessary in most cases to give sodium bicarbonate in much larger doses and for much longer periods than in normal individuals or patients suffering from certain other diseases; the alkali tolerance was therefore increased. During this investigation he noticed that the administration of massive doses of bicarbonate, instead of the usual small or moderate doses so often given in the malady, had frequently a most beneficial effect, especially as regards improvement in the intestinal symptoms, and seemed to help greatly the action of the dietetic treatment.

The routine method of treatment he now uses in sprue is generally the following: The patient is kept at complete rest in bed and is placed at first on a strict milk diet. The mouth is kept scrupulously clean by using a diluted alum-carbolic mouth-wash:

Glycerol alum,
Glycerol acid carbol., āā f̄iv;
Aq. rosæ, q. s. ad f̄iv.

One teaspoonful to a tumbler of water.

And when painful patches on the tongue

are present, a cocaine-carbolic mouth-wash will be found useful:

Cocainæ hydrochlor., gr. v;
Acid carbol., f3j;
Glycerol boracic, f3vj;
Aq. rosæ, ad f3iv.

Half to one teaspoonful to a tumbler of water.

A mild alkaline tooth-paste should be used to brush the teeth with several times daily. Quite a number of private patients come to him toothless; apparently the first advice most of them had received on arriving in Europe was to have all of their teeth extracted. He has never seen in cases of genuine sprue the course of the disease arrested by such a procedure, and he strongly deprecates it, except in those cases in which the sprue condition of the mouth is complicated by true severe pyorrhea. If there is history of recent amebic dysentery—and this is in his experience very often the case—he gives at once a course of six or twelve emetine injections.

In addition to these measures, the patient is placed on an intensive alkaline treatment, which is carried out (a) by giving very large doses of sodium bicarbonate by the mouth, and (b) by intravenous injections of a 2- or 4-per-cent bicarbonate solution.

In a number of cases the administration of large doses of bicarbonate by the mouth is sufficient. It is given in drachm doses, 1 drachm three times daily for the first three days, 2 drachms three times daily for eight or ten days, and afterwards 3 drachms, or more, three times daily for several weeks. No untoward effects are noticed, but not rarely the patient feels and looks somewhat drowsy for a few days. If the drowsiness becomes marked the dose should be decreased. Papain, taka-diastrase, pancreatin, etc., may be added to the bicarbonate, but the effect of these digestive drugs is not very brilliant in the acute stage of the malady, and he generally omits them altogether during the first weeks of the treatment; later, such preparations, and especially pancreatic extracts as emphasized by Brown, are useful. When the diarrhea is very severe 5 to 10 grains of salol may

be added to the bicarbonate, but powerful astringents should always be avoided. The addition of a little salol to the powders is also useful when the urine becomes too strongly alkaline. In those rare cases in which there is constipation, magnesium carbonate gr. x-xx may be substituted for salol.

The standard formula for the powders is:

Pulv. cinnamomi, gr. ss;
Pulv. ipecac, gr. ss;
Pancreatin, papain, or takadiastase, gr. iij;
Salol, gr. v;
Sod. bicarb., 3iij.

The powders should be given in half a tumbler of water.

The amount of the ingredients should be varied according to the symptoms presented by the patient, as already stated, and some of the drugs (cinnamon, ipecacuanha, pancreatin, salol) may be left out altogether. At times in conjunction with the powders he has found it useful to administer bile salts (sodium taurocholate gr. ij in cachets t.i.d.).

In certain peculiar cases of sprue characterized by severe asthenia and a distinct hyperpigmentation of the skin, in addition to the bicarbonate treatment, he has given adrenalin with good results.

He has used intravenous injections of sodium bicarbonate so far in six cases, always in combination with the internal administration of large doses of bicarbonate as described above. Ten to twenty ounces of a 2- or 4-per-cent solution of bicarbonate is given slowly every day or every other day until twelve injections have been given; then the patient has a rest, but the intensive alkaline treatment by the mouth is continued. After an interval of one or two weeks another course of injections is given, and a third course may be necessary after a further interval. The intravenous injection should be given preferably by the gravitation method, observing all the precautions commonly used in intravenous therapy. In the sterilization of the solution care should be taken to prevent any excessive formation of the carbonate, and this end is best achieved by taking the precautions suggested by Sellard—namely, the

bicarbonate solution should be put in strong narrow-mouthed bottles which are filled almost full in order to reduce the air space to a minimum, tightly-fitting stoppers being used. As an additional precaution these bottles can be sterilized in an atmosphere of carbon dioxide; this can be easily obtained by raising the autoclave to the boiling temperature, while water at the boiling point is provided at the bottom of the autoclave, and a handful of bicarbonate is thrown into the hot water.

He has used the bicarbonate treatment here described in a large number of cases, and in 11, most of them private patients, he has been able to follow the course closely. His experience has been that sprue cases having this treatment, in addition to the usual dietetic measures, improve more rapidly than patients having only the dietetic treatment, though of course there are exceptions. It is interesting to note that the intestinal symptoms seem to be much more beneficially influenced than the mouth symptoms.

As regards the mode of action of the intensive bicarbonate treatment, he has very few remarks to offer. At one time he believed that large doses of bicarbonate by decreasing the acidity of the intestinal contents might check the growth of monilia fungi, considered by some authors to be the true cause of the malady, and by Low and himself to be merely the cause of certain symptoms, as, for instance, the frothiness of the stools. If recent hypotheses concerning the etiology of the malady be proved correct, then a different explanation will have to be found. At any rate, there appears to be little doubt that in sprue a certain degree of acidosis is often present, and that an intensive alkaline treatment is indicated.

He concludes that the administration in sprue of massive doses of sodium bicarbonate by the mouth and intravenously, in conjunction with the usual dietetic measures, gives satisfactory results in a large number of cases, especially as regards the intestinal symptoms of the malady.

Surgical and Genito-Urinary Therapeutics

Results of "Forage" of the Prostate.

LUYS (*Urologic and Cutaneous Review*, February, 1921) states that "forage" of the prostate consists in excavating a tunnel through the interior of the hypertrophied gland, under the aid of vision and through the natural passages, in order to permit the free flow of urine at the expense of the obstructions which impede micturition.

In all patients suffering from retention of urine of prostatic origin the surgical treatment has entailed, at least in recent times, the enucleation of the gland either by the perineal route or more often by the transvesical route. In these cases, although the surgeon may have completely removed the gland the exact diagnosis of the intrinsic cause of the urinary retention often has remained in obscurity, and the impor-

tance of the surgical procedure has been found altogether disproportionate to the lesion. The prostate has been removed without determining if a lesser procedure would not have had the same result.

Close examination of the mechanical obstructions which hinder micturition show, in fact, that these are minimal and that a less formidable surgical procedure would often suffice to remove their inhibitory effect.

It should be made clear that there are two principal causes of the mechanical dysuria in hypertrophy of the prostate.

The first is due to elevation of the vesical neck. An elevation designated "prostatic bar" is a true dam placed between the bladder and urethra, impeding the evacuation from the bottom of the bladder. This dam

has the form of a roof with two slopes, one of which (vesical) has a slight inclination, and the other (urethral) has a more abrupt and almost vertical inclination.

The second cause, at least as important as the preceding one, is due to the joining of the two hypertrophied lobes of the prostate which, pressed one against the other like two mountains, form an irregular anteroposterior tunnel.

These are the two causes of dysuria in hypertrophy of the prostate which are completely overcome by "forage" of the prostate. In fact, "forage" of the prostate has a double purpose: the first is to destroy the "prostatic bar;" the second is the circular scooping out ("forage") of the joined prostatic lobes along the whole length of the prostatic tunnel.

These two causes are sometimes separated, sometimes associated. Thus in 49 cases of prostatic adenoma treated by Luys he found:

Twenty cases of simple prostatic bar.

Two cases of simple joining of the lateral lobes.

Twenty-seven cases of association of prostatic bar with joining of the lateral lobes.

He has treated 52 patients by "forage" of the prostate, and thus far he has not had a single operative fatality. On these 52 cases he obtained 44 excellent and lasting results, namely, 84.6 per cent of cure.

Of the eight other patients, four are either still under treatment or abandoned the treatment; two obtained moderate results (3.8 per cent), and in two the method was unsuccessful owing to the enormous size of the enlarged prostates (3.8 per cent).

The operation of "forage" is contraindicated only in the type of case in which the prostate is so abnormally large that to effectually tunnel through the whole extent of the prostatic urethra entails such enormous difficulty as to tax the patience both of the surgeon and the patient. It is in such cases that transvesical prostatectomy is preferable.

Perhaps another contraindication is in tight stricture of the urethra, for to carry

out the operation well it is indispensable to have a large canal—but in reality the undilatable urethras are rare exceptions.

The advantages of "forage" are that it is a benign operation with no mortality rate.

It is a non-mutilating operation, as it leaves all the patient's organs intact. It conserves the ejaculatory canals, and the patients, after operation, often have normal sexual relations.

It does not confine the patient to bed.

It may be carried out on patients with renal insufficiency.

It is the only practical operation for young prostatics with acute or chronic retention.

That "forage" sometimes gives results superior to prostatectomy is illustrated by an example.

Radium and Nevus.

ABBE (*Urologic and Cutaneous Review*, February, 1921), calling attention to the marginal vessels around radium scars, finds that ignipuncture is the only satisfactory cure. The art in doing this is to use an ordinary lady's hat-pin with a wad of damp cotton enveloping it two inches from the point. This must be heated to cherry-red heat in a flame and pricked into the vein at a black heat, when maximum coagulation and no bleeding will seal the vessel with almost invisible puncture scar. To apply radium to nevi, it is necessary to give enough to cause erythema, but not to blister, and a very light erythema at that.

In thick angiomatous nevi the best permanent results are more easily obtained than in delicate port-wine marks. Whether these are on the forehead, face, or lips, the one essential in treatment is to compress them so that opposite vessel walls of the spongy mass are in contact during radium-ization. The cross-firing of two flat radium plaques, as in compressing a large angioma of the lip, gives certain cure, if adequate treatment is given. It will always be wiser not to give too much on the first occasion, until accumulated experience shows what

amount will not produce scar. A good guide is the erythema dose—short of blister. It is best to use 1/10 m.m. lead filter with gauze and paper to check secondary radium burns on the skin and apply it for one hour under pressure. After six weeks one can judge the result, not sooner. Then a further delay and a second treatment are due. This applies to light or dark port-wine stains, whose cure should not be attempted at one sitting. Indeed the treatment of a blemish of so important a nature as a port-wine nevus of the face should never be undertaken lightly. The results are to be seen conspicuously for life, and it should be arranged with full understanding of the patient that no haste should be made, nor exalted expectations permitted. Else the result may disappoint.

The treatment should be at intervals of three months, and extend over not less than two years. This will give due time for slow tissue changes to manifest themselves and color changes to occur. It will be difficult for surgeon or patient to remember the exact shade of purplish-red skin which was in evidence before treatment after two years have passed, unless color photographs (Lumiere) or color illustrations be made beforehand. In all cases radium applications to delicate skin nevi of the face should be made by slow movement of the applicator over the area treated during the entire sitting, else the result will be spotty.

Large, purple cavernous angioma of the tongue can be well reduced by a flat radium applicator compressing the tongue to flatten the vessels. The tongue should be made tender by one application, which may be repeated in two months.

The lip is often the seat of a single, round, purple angioma, raised like a split pea. This can be caused to disappear by two or three good radiumizations of the same duration as other cavernous angiomata.

In massive, deep cavernous angiomata covered by a natural skin, it is permissible to introduce small radium tubes or needles,

sterilized, into the center of the mass, to bring about blocking of the vascular mass.

Experience has shown that the surgeon must approach the radium treatment of nevi with the same caution that he would exercise in any cosmetic operation on the face, always mindful that a scar, or a scarred nevus, is a lifelong defect and may be more regretted than the original condition. Yet with caution many excellent results are obtained.

Radium and X-ray in Carcinoma of the Breast.

QUICK (*Surgery, Gynecology and Obstetrics*, February, 1921) in an article on this subject concludes as follows:

The *x*-ray occupies a place in the treatment of every case of carcinoma of the breast.

In certain cases radium may be used to considerable advantage in combination with the *x*-ray.

The cases in which radium proves valuable in this combination are mainly:

Localized flat recurrences where surface applications of radium can be made directly over the lesion.

Bulky recurrences where radium emanation can be embedded directly into the tumor.

Axillary involvement which is always difficult to influence favorably with *x*-ray alone, where radium emanation can be embedded in the neoplasm or in axillary fat tissue so as to give a diffuse radiation of the axillary space from within.

Inoperable primary cases in which embedded emanation can be utilized to radiate the tumor from within, as well as the axilla, and even to attack supraclavicular space in the same way, if necessary.

Primary cases refusing operation where treatment may be carried out much in the same way as in the inoperable primary cases.

The combination of radium and *x*-ray may, in some instances, change an inoperable into an operable case.

When one embeds radium emanation

needles in a primary tumor and in invaded lymph nodes and follows with massive x-ray dosage through the skin, a powerful destructive effect is produced on the tumor tissues amounting to local necrosis, the lymphatics may reasonably be considered sealed, invisible vagrant cells are incarcerated or destroyed, and all this is accomplished without removing the natural barriers which exist against progressive carcinoma, to wit, both types of lymphocytes and plasma cells and the growth of connective tissue around the tumor; these are the only natural agents of resistance to carcinoma that we know anything about. The treatment of mammary cancer by these physical agents is, therefore, based on sound theory, since it intensifies the natural reaction of the tissues to carcinoma, while producing in addition a very strong destructive action on the tumor.

In view of these theoretical considerations and of our clinical results to date we feel that the scope of operability in mammary cancer should be reduced. Already the pendulum has swung far in this direction in other fields, notably in uterine carcinoma. Here the fallacy of operating on advanced growths has been generally recognized, surgery has been reserved for the early cases, and physical agents have been substituted in the others as offering the greatest amount of relief for the longest period. There is no good reason why such a principle should not be applied in carcinoma of the breast as well.

Arsphenamine-serum Precipitates and Their Relation to Clinical Reactions.

SCHAMBERG, TOKUDA and KOLMER (*Archives of Dermatology and Syphilology*, March, 1921) observe that of the numerous theories advanced in explanation of the reactions and fatalities following the intravenous injection of solutions of arsphenamine, considerable attention has been given to those based on the formation of precipitates in the blood which may result in pulmonary embolism and the production of immediate symptoms and even death.

As a result, the amount of alkali in the solutions of arsphenamine has great influence on the reactions following the mixture of a serum and arsphenamine in test tubes. For this reason the solutions of monosodium arsphenamine produce more precipitates than the disodium solutions because the latter contain an excess of alkali. Furthermore, all precipitates, including those produced when acid solutions of arsphenamine are mixed with serums, can be dissolved at once by the addition of a few drops of a normal solution of sodium hydroxide. This constitutes proof that the precipitate is a drug precipitate and not a protein precipitate, because a protein precipitate could not be redissolved in this manner.

The amount of alkali in the solutions of neoarsphenamine may have a similar relation to the results observed when solutions are mixed with serums. The results observed in these experiments indicated that the solution of some lots of neoarsphenamine produced more positive reactions than other lots; furthermore, the addition of a single drop of normal sodium hydroxide immediately dissolved the precipitates and yielded clear solutions.

The serums of patients exhibiting immediate (nitritoid) reactions after neoarsphenamine did not form precipitates when brought in contact, in the test tube, with solutions of neoarsphenamine. Negative results were similarly obtained with the serums of patients who had febrile and gastrointestinal reactions.

Test-tube precipitates of arsphenamine occurred as frequently and as pronouncedly with the serums of patients not exhibiting febrile and gastrointestinal reactions after arsphenamine as with the serums of those who did manifest such reactions. As practically no nitritoid reactions occurred after arsphenamine during the period of this study the serums of such patients could not be tested.

In so far as the results observed with the serums of patients showing immediate (nitritoid) reactions after the administration of neoarsphenamine are concerned, the authors found no evidence to support the deductions of Berman that these simple

tests will serve to foretell the occurrence of these reactions, although it must be stated that Berman's tests were conducted with the serums of patients who had "nitritoid" reactions after the administration of arsphenamine.

It is highly probable that the reactions observed when serums and solutions of arsphenamine and neoarsphenamine are mixed in test tubes, are primarily dependent on the amount of alkali present in the solutions or in the serums. The amount of alkali present in different lots of arsphenamine and neoarsphenamine is likely to vary and thereby influence the occurrence of precipitates with different lots of the drugs and the serums of patients. These precipitates are largely composed of arsphenamine or neoarsphenamine rather than of serum proteins, and are readily dissolved by the addition of traces of sodium hydroxide.

Routes of Access to the Heart.

MATAS (*Medical Record*, April 9, 1921) thus briefly sums up the lessons which have a direct bearing upon the heart in general with reference to the extraction of foreign bodies.

The indispensable association and collaboration of the radiologist with the surgeon for diagnostic and operative purposes.

The proved efficiency of this collaboration has added vastly to the safety of the intrathoracic manipulations and to procedures for the extraction of foreign bodies, which hitherto have been regarded as largely impracticable if not visionary.

The disregard of the pleura and of the risks of acute surgical pneumothorax, contrary to all preconceived notions of the gravity of this complication in ante-bellum days.

After a description of avenues of approach he alludes to the method of Petit de la Villeon, to wit: the search for intrathoracic projectiles under the fluoroscopic screen and extracting them through the smallest button-hole openings. The openings are made in the intercostal spaces after a careful localization of the projectile, and

with this in constant view, a long, blunt-pointed forceps extracts it wherever it may be. This method, called "forceps under screen," is one of the most extraordinary and sensational developments of this war's experience. In 1919 De la Villeon reported the extraction of 14 projectiles from the cardiopericardial or cardiopulmonary areas. All of these patients were up and about in from three to five days after the operation. The "permissible zone" of attack was the pericardium, the thick wall of the left ventricle, and the thicker cone of the apex, but in any case the depth of penetration of the forceps should never exceed the more superficial layers of the myocardium and not deeper than 3 mm. from the visceral layer of the pericardium.

Matas quotes Delorme's statistics gathered from French military sources during the war, including 25 cases. Ten of the missiles had been removed from the right ventricle, three from the right auricle, two from the left ventricle, and one from the left auricle. The result in thirteen cases was ten recoveries and three deaths. LeFort states he has removed eleven foreign bodies from the heart in the course of nine operations; in two cases from the heart cavities, with only one death.

Pierre Duval, including the operated and unoperated cases to December, 1918, sums up the gross comparative statistics for late or delayed operations for cardiac projectiles. The total number of war projectiles in the heart up to 1918 is 62. Of the 62 cases 39 were parietal. Of these 16 were operated, with 14 recoveries and 2 deaths; 23 were not operated, with 23 recoveries and no deaths. There were 23 cases of projectiles retained in the heart cavities, of which 10 were operated, with 7 recoveries and three deaths; not operated, 13, with 12 recoveries and 1 death.

Matas states that, judging by statistics, it plainly follows that non-intervention should be the rule. Evidently, however, the indications for operation cannot be definitely formulated. They must be based upon the individual prognosis from the point of view of the condition of the patient, the degree

and duration of his disability. It is only when life is threatened by the presence of the projectile, and the patient thoroughly understands his danger as well as the risks of the operation, that this can be regarded as justifiable. If an operation is decided upon, it is then that the advances and the new knowledge of the technique acquired by the experience of the late war will prove to be invaluable acquisitions.

The Standardization of Methods of Treatment in Orthopedic Surgery and in Industrial Surgery of the Extremities and Spinal Column.

OSGOOD (*Illinois Medical Journal*, April, 1921) under this title observes that standardization must come first of all by thorough and entirely impartial study of our end results, not of months, but of years. The standards must constantly change, must advance, by research, by perfecting operative technique, by ingenuity in devising apparatus, and by ascertaining the value of various physiotherapeutic measures, but we can at least start to honestly study our end results now, enormously helped by the unfortunate plenitude of cases with which the war has furnished us at home and abroad.

The standardized methods of treatment of the systemic disease are the same in adults and children. Rest, followed by as much function-returning exercise as is safe, outdoor air, heliotherapy in scientifically applied dosage—these are the irreducible minima. No one who has visited Rollier's clinic on the Alp at Leysin or who has watched cases in this country treated by his methods can fail to be impressed by the greatly enhanced general high health with which the sun's rays provide the patient, enabling him to combat and often to overcome the systemic disease.

When we approach the problem of the treatment of the local lesion we must apply methods which are often very different in the lesions of children and adults.

In children the standard method of treat-

ment of tuberculous joints is rest and fixation without open operation.

In adults we may say in general that the standard method is excision, striving and expecting to overcome the disease by depriving the joint of motion, and, therefore, of the type of bony tissue in which the tubercle bacillus is most prone to grow.

In the hip-joint in children there are still polemics as to whether fixation alone, with symptomless weight-bearing allowed, or fixation plus traction, and without direct weight-bearing, is likely to give the best end results. The one party maintains with Lorenz that a firmly ankylosed hip, in good weight-bearing position, is the safest and most useful end result in tuberculosis of the hip, and that simple fixation with weight-bearing is the best way to obtain it. The other group maintains with Bradford that we may look with hope for the restoration of a range of motion which is without danger. The social condition of the patient and hospital facilities largely dictate the method of choice. If he can receive little attention, a plaster spica is perhaps safest. If he can have careful home or hospital care, with intelligent attention to his traction, preferably in an abduction hip splint, the arguments for its use, based on the morbid anatomy of the lesion, would seem to bear most weight.

The routine employment of homogenous bone grafts or extensive ankylosing operations on the spine in tubercular caries in young children is still *sub judice*. Recumbency in a corrective position on a Bradford frame can still show as permanently good results as any ankylosing operation and without too great sacrifice of time. To be safe we must stiffen by operation larger areas of the spine than nature does, and the story of possible secondary back and pelvic joint strain in later life has not been written.

In adults the boiled beef bone graft advocated by Gallie and employed in the largest series of cases by Brown seems to bring about as firm an ankylosis in a short time and to be tolerated as well as the more mutilating homogenous grafts. This should

be combined with a fusion operation after Hibbs's method.

When we see a bow-legged or knock-kneed child our first thought is braces or operation, but we must dismiss the thought until we are able to answer two questions: (1) Is the nutritional disease quiescent? (2) Is the deformity increasing or diminishing? Surprisingly bad cases of both deformities correct themselves if the underlying disease is controlled. All light cases may be said to do so. If corrective operation is decided upon, shall we do an open osteotomy, shall we break the bones without the skin (if we are lucky) in one of the many efficient forms of osteoclasis, or shall we with strong hands strive to correct the deformity by separating the epiphyses after the method of Codivilla? There may be methods of choice in individual cases, but the large series of successful end results of the osteoclases of Blanchard and the epiphyseal slidings of Codivilla should make us slow to condemn these rather rough—one may say almost brutal—but quite safe methods.

Adolescent rickets, if there is such a disease, is another story. The so-called epiphyseal separation of the hip with coxa vara in fat boys and girls with small genitalia occurs usually only as a symptom of this disease, and is traumatic only in the sense that the final complete separation may occur as a direct result of very slight injuries. They may be usually greatly improved and often completely corrected by manipulation under full anesthesia and fixation in full abduction. Preliminary bed traction is often helpful in old or extreme cases.

There is no standard method of treatment of scoliosis, nor are we able in many cases to secure anything like complete correction or even prevent the development of deformity under our very eyes by any method of treatment, exaggerated and hopeful claims to the contrary.

We must, first of all, see to it that we follow Ambrose Paré and strive to do no harm. Scoliosis is not faulty statics alone, else would every short leg in hip disease or

in infantile palsy surely develop it. They do not. It may be faulty statics, congenital or acquired, plus bone disease akin to rickets or osteomalacia, or it may be bone disease alone. We seem to arrest or even correct many slight early cases by exercise, by light corrective braces, perhaps by forcible plaster jackets, but perchance the underlying bone disease corrects itself and nature does in reality what we seem to do. In severe progressive curvatures it would seem rational to impose recumbency plus medication, plus hyperemic physiotherapy, plus corrective appliances, but let us first remove the force of deforming gravity, always at work in the erect position.

Lorenz and others have claimed in young children 80 to 90 per cent of anatomically perfect reductions in congenital dislocations of the hip by the bloodless method. This per cent is probably in the light of the end results considerably too high. Moreover, secondary changes in the contour of the joint surfaces which follow repositions and later impair joint function are more common than has been supposed. On the other hand, reduction by open operation has left far too many stiff hips in its train, unless we find that Galloway's recently reported large percentage of successes can be duplicated by other surgeons. Bloodless reduction is still the method of choice, with after-care a most important element in the ultimate correction. Up to four years, reposition is usually comparatively easy, but retention by no means sure. After seven, every successful case should be reported and medical literature will not be encumbered by these reports.

When should we begin to correct a congenital club-foot? The day we discover it. First, by daily manipulation and adhesive plaster or soft-dressing retention in infants, and plaster-of-Paris dressings in later childhood, until once correction has been obtained and weight-bearing in slight valgus can aid in maintaining the correction. In resistant cases of over four years, which have not been amenable to correction by repeated manipulations and retention in the three-part plaster of Fiske, Ober's opera-

tion, which consists of an open subperiosteal freeing of all restricting ligaments, deltoid, calcaneo-scaphoid, and plantar, is usually successful and non-mutilating. The twist of the os calcis must be corrected as an important base of the deformity, and if the fore foot still persists in turning in, the careful osteotomies and ostectomies of the tarsus and metatarsus after Hoke's methods are efficient. Bone operations in general are not standard methods of treatment in childhood.

In poliomyelitis it is almost futile to attempt to outline standard methods of treatment. In the early stages, for six months, probably a year, prevention of deformity is the only surgical treatment and is of utmost importance. Unexpectedly complete recovery often occurs. We also know that tendon transplantation, supplemented by tenotomies if contractures have been allowed to occur, is our next procedure. The groups which may be transplanted with more or less standard results are becoming known and their number is diminishing with the knowledge.

Can we standardize the treatment of foot strain and faulty weight-bearing, this common and crippling condition affecting the laboring and leisure classes? The most efficient feet are often perfectly flat in standing. If we recognize that strained feet, not flat feet necessarily, are almost always induced by imperfect or inadequate muscle action we shall succeed in standardizing our treatment and in relieving our patients.

If our cure is to be permanent we must permanently restore normal balance to the muscles. They will often restore the balance themselves if given a chance. If not, we must correct faulty body posture, teach them proper methods of walking, exercise the adductor muscles at the expense of the abductors. Restoration of normal balance is the standard treatment.

In anterior arch troubles and painful callosities the problem is the same—first, lift the patient off the painful metatarsal heads and mold the arch back by lateral pressure and supporting pads or plates; then teach the

patient to lift his own metatarsal heads off the ground by the development of the long flexors of the toes and the intrinsic muscles of the foot. Rigid feet must be usually dealt with by manipulation or open operation, and are rarely completely relieved.

One of the direct results of the war has been the standardization of the treatment of infected bone. The principle is disinfection. Many disinfectants have been used. Dakin's solution and Carrel's meticulous technique have shown better results than any others, and what is significant, these results have been repeated by other surgeons who have omitted no essentials of the method. Macroscopically infected bone must be surgically removed so as to leave a crater with no overhanging edges. When the bacterial count remains practically zero most of these craters may be filled with muscle or skin flaps and a secondary skin closure attempted, with excellent hope of success.

Curettage of the bone is no longer standard treatment, and the measure of its success we know, by the almost certain recurrences of trouble which have rewarded the former routine treatment. The surgeon who uses a curette to clean bone except in very rare instances should not to-day be considered a bone surgeon.

Although the war furnished an unfortunate plethora of infected joints, it contributed less than is generally supposed to the available knowledge of the treatment of joint infections. In one important particular it may be said to have revolutionized treatment. Willems has apparently demonstrated that early voluntary joint motion, even in the presence of open wounds, provides the most adequate drainage and preserves the greatest amount of function.

In spite of favorable reports, the writer's experience with septic joints does not lead him to believe that drainage is usually greatly bettered by the procedure. The end results have been certainly very distressing in many instances.

In joints upon which clean operations for internal derangements have been performed Osgood believes that early voluntary mo-

tion, as soon as the stitches are out, perhaps before, will become a standard method of treatment.

In lower limb amputation we should provide a provisional prosthesis, usually in the form of a plaster pylon, and begin weight-bearing as soon as our wounds are closed, sometimes in infected stumps even in the presence of granulating surfaces. The mental condition of the patient is enormously benefited thereby and the stump shrinking and hardening is hastened. The date when the final definitive limb may be supplied is brought nearer. This matter of early weight-bearing is of great importance.

Three rules to be followed in standardizing the treatment of sprains are:

Be sure the sprain is not a fracture or a sprain-fracture. If one exists we must prevent exuberant callus by more complete immobilization and less complete function.

Determine the exact anatomy of the lesion by ascertaining the method of its production and its mechanical necessities.

Protect the torn ligament or ligaments, usually by adhesive plaster, and allow immediate function, the completeness of which is directly proportionate to the completeness of the protection.

As to dislocation, the standard of treatment is complete reduction and incomplete fixation. At the earliest possible moment, surely within a week, slight voluntary movement by the patient should be encouraged at least once a day, the retentive apparatus being removed under observation.

Treatment of Hemorrhoids by Electrolysis.

WEBB (*British Medical Journal*, March 26, 1921) thus describes his procedure:

The patient, having had the bowels thoroughly cleared out by an aperient over night and a saline in the morning, is placed on the left side, and a large indifferent electrode, connected to the negative terminal of a source of constant current, is applied over the right buttock and hip, taking care that it is in close apposition with the skin. If the hemorrhoid is not fully prolapsed the

patient is asked to strain to bring it down. The pile is now painted with a mixture of phenol gr. 30, menthol gr. 30, quinine hydrochlor. gr. 22, adrenalin gr. 1/100, which Webb has found to be the best "surface anesthetic," and after a minute or two it will be found that a local anesthetic can be injected into the tissue below the base of hemorrhoid without pain, provided that a sharp fine needle be employed. Webb usually employs sol. urea and quin. hydrochlor. (Parke, Davis & Co.). After about ten minutes the pile is completely anesthetic, though almost immediately after being painted it can be painlessly grasped with artery catch forceps to prevent its retraction. Two or three long zinc needles, or thin spears made from "slivers" of sheet zinc and soldered to flexible insulated wire, are thrust into the base of the pile parallel to its long axis, and several more into the substance of the pile. All these needles are connected to the positive pole of the source of current, and are packed round with oiled wool to prevent their causing blisters on the parts round the anus. The current is now slowly turned on till a strength equal to about 12 to 15 milliamperes per needle is reached, and is allowed to flow for ten or fifteen minutes and then gradually turned off. It will be found that the needles are quite difficult to withdraw owing to the firmness of the clot formed, and it is often well to reverse the current, making the needles negative, for a couple of minutes to facilitate withdrawal.

After the treatment the pile has changed from purple-red to gray. It is covered with adrenalin and chloretone ointment and pushed well up into the rectum, and a suppository of chloretone gr. 5, morphine gr. 1/4, and novocaine gr. 1/4 inserted. The patient is sent home with direction to go to bed for twenty-four hours, to take a dose of confection of senna and sulphur the following night, and is also instructed that should the pile prolapse it must be replaced at once.

The process by which the hemorrhoid is cured is twofold. The vasa vasorum are obliterated, and thus the blood supply is cut

off from the walls of the vein, and at the same time a firm, closely adherent clot is formed in the lumen of the dilated portion.

There is no necessity to dilate the sphincter.

The treatment is not applicable to very large piles nor those that do not protrude.

Silver Salvarsan in the Treatment of Syphilis.

WALSON (*American Journal of the Medical Sciences*, March, 1921) has treated over 800 cases with silver and mercury and more than 6000 injections have been given. Kolle states that silver salvarsan contains 22.4 per cent arsenic and 14.1 per cent silver. It is suggested that silver salvarsan is hydrolyzed in the body and set free as true colloids. The dose is prepared in ampoules containing one-tenth of a gramme, fifteen-hundredths gm., two-tenths gm., three-tenths gm. The powder is grayish-black and in solution takes on an ichthyol brown color.

It keeps in its ampoules an unlimited time. Small cracks in the glass permitting the entrance of air cause silver salvarsan to become decomposed and thereby made poisonous. In giving this preparation Kolle recommends 10 Cc. of distilled water to each one-tenth gramme of the drug. Injection should be given slowly, in doubly distilled water.

Walson summarizes his article as follows: According to results obtained from animal experimentation, silver salvarsan is the strongest spirocheticide as well as being the least toxic of all arsenobenzol preparations, and nothing has so far developed in its clinical application to contradict these observations.

Silver salvarsan deteriorates rapidly when exposed to the air, and this deterioration is recognized best when the silver salvarsan is placed in solution.

The technique of administration requires strict asepsis, freshly distilled sterilized water in the proportion of 10 Cc. to each one-tenth gm. of silver salvarsan.

Silver salvarsan powder must be completely dissolved before administration.

Proper precaution to prevent extravasation of the silver salvarsan solution into the surrounding tissues is essential.

Slow administration—i.e., not less than one minute.

If silver salvarsan is used alone probably the best treatment (based on the results reported in recent literature) is as follows:

Begin the treatment with one-tenth gm. of silver salvarsan, increase dosage to two-tenths gm. for women and twenty-five-hundredths gm. for men as a maximum dose, with an interval of four days between doses, and never give more than 2 gm. in any one month.

The results obtained in primary syphilis on the Wassermann reaction are as good, if not better, than with any other arsenobenzol preparation used in combination with mercury.

In secondary syphilis the Wassermann reaction is reversed to negative as rapidly with mercury and silver salvarsan as with any other arsenobenzol preparation with mercury.

Mercury should be given with silver salvarsan in the treatment of syphilis. Whether or not it should be given at the same time or following the silver salvarsan is another question. In military service it is desirable to give the two at the same time.

The effect of silver salvarsan on all clinical manifestations of syphilis is decidedly rapid, and appears at least as effective as that of any other arsenobenzol preparation.

Alarming effects of silver salvarsan were never seen in any of the cases.

Constant vigilance in the administration of all arsenobenzol preparations is essential. Particular attention should be given to patient's weight and to a beginning erythema. Functional kidney and liver tests are indicated.

Kolle, Ritz, Galewsky, Hauck and Gennerich appear to be of opinion that silver salvarsan is better than any other salvarsan preparation. Boas, Kissmeyer and Müller seem to think that silver salvarsan is on a par with salvarsan. Dreyfus, Kerl, Schoen-

feld, Birnbaum, Lowenberg and Goldberger think that silver salvarsan is better than neosalvarsan. Hoffmann, Knopf, Scholtz and Sinn prefer salvarsan to silver salvarsan. Von Nothhaft says he obtains no better results from silver salvarsan than from other salvarsan preparations. Friedlaender, Sellei and Hahn speak of very good results from silver salvarsan; Fabry says it might well be called upon to supplement or supplant neosalvarsan.

Simple Procedure for Avoiding Anaphylactic Shock.

Under this title in the *Medical Record* of April 16, 1921, this matter is thus discussed:

Anaphylactic shock can be avoided, as Roux, Besredka, Banzhof, and Fumulener have shown experimentally, by inducing hypnosis before the injection is given, by means of chloralose, chloral, or urethane. More recently still Kopaczewski and the Roffos have noted that it was possible to prevent the production of acute anaphylactic accidents by means of ethereal solutions without going to the extent of producing anesthesia, and these observers have attributed the preventive properties of all these substances to a common physical character they present, namely, that of decreasing the surface tension of the serum. They came to the conclusion that in the future all influence of the nervous system that has been supposed to exist in the genesis of anaphylactic shock is to be discarded, as this phenomenon depends principally on a reaction of colloidal flocculation and asphyxia correlated to occlusion of the capillary networks by aggregations of micellæ. Although regarding with reserve the part that these observers attribute to surface tension in the production of anaphylactic shock, Lumière and others have for some time suspected that the serum injection provoked the formation of a precipitate in the blood plasma which might be the initial cause of the phenomena observed.

This explanation is in accord with the well-known fact that when an animal is

prepared by the injection of foreign albuminoid matter, its serum at the end of a few weeks acquires the property of producing flocculation in the solution of albumin employed. It is therefore logical to suppose that the hemoclastic paroxysm induced by the secondary injection of this same albuminoid matter in the prepared animal is attributable to the formation in the blood of a precipitate susceptible of profoundly disturbing the capillary circulation. Richet, by injecting an untreated animal with a mixture of the blood of a sensitized animal and the substance giving rise to the paroxysm, obtained the usual results. Briot, Friedberger, Friedmann, and several others have also provoked anaphylactic shock by treating normal animals with mixtures of sera reacting on each other and giving rise to flocculation.

In order to verify the above hypothesis, Lumière and Chevrotier have carried out a series of experiments with the attempt to discover the chemical combinations capable of preventing the production of this flocculation. They injected sheep's serum into an ass in small but repeated doses, and forty days after the last injection the ass was bled and the serum obtained was distributed in tubes to which various substances, including sheep's serum, had been added in order to determine those which prevented mutual precipitation of the sera. Contrary to what they expected, these observers found only a very few reagents susceptible of fulfilling this condition, the precipitate being remarkably insoluble in almost all the bodies essayed, and those which they thought would be the best—sodium sulphocyanide, sodium ethylosulphate, and sodium hyposulphite—had not the power of absolutely preventing all precipitation.

On account of its low toxicity, sodium hyposulphite appeared to be the best of all for the prevention of anaphylactic shock, and in order to be assured of the exactitude of this supposition these observers prepared two lots of guinea-pigs by injecting into each 1/500 Cc. of normal sheep's serum. Thirty days later the animals were given an intracardiac injection of ½ Cc. of the

same serum, to which was added $\frac{1}{2}$ Cc. of an 8:1000 isotonic solution of sodium chloride. Without an exception they all died in one or two minutes, after presenting paralysis of the hind legs and convulsions. In the animals comprising the second lot prepared in the same way, the NaCl solution was replaced by the same volume of a 5-per-cent solution of sodium hyposulphite, and it was found that no anaphylactic accident occurred. The serum in the dose which had produced shock in the control animals gave rise to no symptom. The same experiments were repeated with antidiphtheric serum and gave exactly the same results. Sodium hyposulphite does not appear to destroy or even attenuate the properties of the antitoxic sera, and these observers are now undertaking experiments to ascertain the influence of a prolonged contact of these bodies, with the object of demonstrating that no ill result ensues from the use of such mixtures. They point out that they have not yet determined the action of sodium hyposulphite so far as late anaphylactic accidents or secondary serological effects are concerned, but from the results so far obtained they maintain that we now have a simple and entirely safe means of preventing anaphylactic shock.

Pathological Conditions of the Duodenum.

JUDD (*The Journal-Lancet*, April 15, 1921) notes that the duodenum occupies an important anatomic and physiologic position just distal to the stomach. The upper third almost seems to be a part of the stomach; at least, it is intimately associated with it and with the mechanics of emptying the stomach. The duodenum is an important organ physiologically because the secretory ducts of the liver and pancreas discharge into it, and because it has a secretion of its own and contains the Brunner's glands, which are not found in any other part of the body. It has been shown that in cases of acute intestinal obstruction the grave manifestations and death are usually due to the absorption of toxins formed in the duo-

denum, which in very small amount will cause the death of an animal.

In spite of this apparent great importance of the duodenum Mann and Kawamura have recently shown that many animals seem to exist as well after removal of the duodenum as before.

Under normal conditions the duodenum maintains a fairly normal position, shape, and size, but under some conditions it becomes greatly dilated throughout its entire length. The dilatation is diffuse, beginning at the pylorus, and extending through the duodenum and usually into the upper part of the jejunum. The lumen becomes many times greater than normal; the wall of the intestine is thickened, and often it seems to be edematous. The clinical manifestations of dilatation are those of an incomplete obstruction of the upper tract. The diagnosis is usually made by means of the Röntgen ray after a barium meal; in some cases visible peristalsis is well marked.

Diverticulum occurs rather often in the duodenum. In most instances it is acquired and is produced by the contracting scar of an ulcer. In many persons pouches form in the duodenum, and in some persons these pouches become true diverticula. Congenital diverticula occur also, although less often, and usually they are associated with ulcer. The opening of the diverticulum in the congenital case is said to be most often on the pancreatic side of the duodenum and only a short distance below the pylorus. In many cases symptoms are not produced, but in some cases the symptoms are similar to those from ulcer, except that the pain is not relieved by food. Under these circumstances it is necessary to remove the diverticular sac. Interesting cases of diverticulum of the duodenum have been reported by Ritchie and McWhorter, and one recently by Moore.

Ulceration in the duodenum occurs frequently. From 1906 to 1921, 4901 operations for ulcer of the duodenum were performed in the Mayo clinic. Wilkie found 41 cases in 490 routine necropsies. Undoubtedly these ulcers may occur without producing symptoms. Gruber once stated

that 75 per cent of the duodenal ulcers found at necropsy were not diagnosed during life; at that time the so-called silent ulcer was believed to occur more often in the arteriosclerotic patient. Undoubtedly, the silent ulcer and failure to diagnose ulcer do not occur so often as formerly. It is rather unusual that our knowledge of ulcers in the duodenum should have been obtained by the surgeon from his study of conditions at the time of operation and not from post-mortem examination. Only after some time and much discussion the European pathologists agreed with the English and American surgeons that ulcer occurs in the duodenum, and that it occurs there more frequently than in the stomach.

Ulcer of the duodenum may be present at any age, although it is most frequent during middle life. It occurs four times as often in males as in females. If the ulcer is on the anterior surface it is always visible, and in certain instances can be palpated. In many instances it will be found on the anterior surface near the upper border. In more than 90 per cent of the cases the ulcer occurs in the first inch of the duodenum. As long as gastroenterostomy was performed in all the cases and the ulcer or the duodenum was not disturbed it was difficult to get a good idea of the lesion. Now that the duodenum is more frequently explored by an incision and the ulcers excised more often our ideas of the pathologic condition have changed. The author has been surprised to find multiple ulcers so often. A posterior ulcer was found in nearly half of the cases in which they excised an ulcer from the anterior surface, from which fact he believes that multiple ulcers occur in more than 10 to 20 per cent of cases. Also, since a search has been made for ulcer on the deep surface several inches from the pylorus many have been found at this point.

The ulceration has been found in two distinct forms. In the first the lesion is a true ulcer and in every way similar to ulcer in the stomach. There is a definite congestion and stippling of the peritoneal coat, and usually the induration is rather extensive, so that the lesion can be palpated and recognized as an ulcer with a crater. In the

second type the congestion and stippling on the surface of the duodenum are also present, often more marked than in the true ulcer type, but usually very little if any induration is to be made out in the tissues. In many cases palpation of the lesion is not different from palpation of any other part of the duodenum. On excision instead of finding a crater, as in the first type of ulceration, we find that the entire surface of the mucous membrane appears to be covered with normal mucosa and might be called a healed ulcer if it were not producing symptoms. The entire thickness of the ulcerated area of the duodenum is very little if any greater than that of the normal duodenal wall. If the surface of the mucous membrane is examined very closely it may be found to contain one or more of these pin-point ulcers. Both the submucosa and muscularis are usually infiltrated with round cells, and this infiltration may extend some little distance into the tissues of the wall. To distinguish this type from the true crater-ulcer he has called it the duodenitis type of ulceration or the submucous ulcer.

The results of the long-standing existence of either type of ulcer seem to be the same. The lumen and contour of the duodenum become more and more changed. The contractions of the scars cause puckering of the walls and often a stellate contraction, which draws in several areas of the edges at the same time. Frequently, as a result, pouches and diverticula form. Later, stenosis causes obstruction, which may increase until it is complete; in a few instances the duodenum has been severed completely as a result of the scar. The surrounding structures may become involved, such as the common duct, the ampulla, and the portal vein, but fortunately these complications are rare.

Primary carcinoma or neoplasm of any kind is extremely rare in the duodenum. In spite of the fact that ulcer is so common that we might imagine that carcinoma would occasionally occur, primary cancer of the duodenum that in any way simulates ulcer is practically unknown. In 1918 the author reported a series of cases of primary

carcinoma in the small intestine. During a number of years he operated on practically 1700 patients for primary carcinoma of the stomach and on nearly 1800 patients for carcinoma of the large intestine. During this interval he observed only 22 cases of primary carcinoma of the small intestine; five of these occurred in the duodenum.

Strangulated Hernia in the Aged.

FIELD (*Boston Medical and Surgical Journal*, April 21, 1921) observes that statistics from the larger hospitals show that the mortality incident to acute intestinal obstruction, excluding strangulated hernia, has not been greatly reduced in the last ten or fifteen years. Fortunately, the operative mortality of strangulated hernia has shown much greater improvement.

The factors that have brought about this are earlier recognition, less manipulation of the hernia mass, operation under local anesthesia.

Every patient suffering acute abdominal pain, with or without vomiting or constipation, should have the inguinal and femoral rings examined to ascertain the possibility of strangulation. Neglect of this precaution leads to humiliating and disastrous results. The diagnosis of hernia made, it is brutal and injurious to use much force in the effort to reduce a hernia that is often reduced only with difficulty with the parts wide open.

Local anesthesia is particularly suitable in the treatment of strangulated hernia, unlike many other types of acute intestinal obstruction. The point of obstruction is at once known without searching for it. There is required a minimum amount of traction on the abdominal wall and mesentery and the parts are readily accessible.

The technique used in these cases (common types) is briefly as follows:

Inguinal hernia. Infiltration of skin and subcutaneous tissues along line of usual incision with 0.5-per-cent novocaine; then the needle is plunged straight down until it overcomes the resistance of the external oblique aponeurosis. About half an ounce

of solution is deposited beneath this structure in the position of the ilioinguinal nerve. A little is also injected in the region of the external ring. After waiting a few minutes the incision is then carried down to the external oblique. This structure is carefully opened near the internal ring and the flaps raised, exposing the ilioinguinal nerve which lies on the internal oblique muscle. The nerve is at once blocked by injecting a small amount of solution into it.

This nerve controls nearly nine-tenths of the sensation of this region. The aponeurosis is now cut down through the external ring and also above the internal ring, exposing the iliohypogastric nerve, which is also blocked. This nerve lies above the arching fibers of internal oblique above the ilioinguinal nerve which lies on the internal oblique muscle. The nerve is at once blocked by injecting a small amount of solution into it.

The genital branch of the genito-crural, which lies on the posterior part of the cord, can be blocked later on, or, as is usually the case, a small amount of solution can be injected about the upper part of the cord, which accomplishes the same result. Care must be taken not to puncture any veins. No more novocaine is required except when the sac is tied; a little novocaine is then injected to render the parietal peritoneum insensitive.

The radical operation is now performed, either with or without removal of the testicle. In old men, especially, with recurrent hernia, removal of testicle helps to prevent recurrence.

Femoral hernia must be treated differently from the preceding. The technique is simpler. There are so many nerve branches coming into this region from all sides that it is necessary to use the infiltration method. The skin is injected along the line of incision, which is a vertical one; the subcutaneous tissues about the sac are also injected. The fat is separated from the sac. Gimbernat's ligament must be either cut or stretched with a small retractor. It is rarely necessary to cut Poupart's ligament unless the hernia is very large. If cut, it must be repaired later.

The neck of the sac is freed carefully from the surrounding tissues by finger or retractor. There is usually fluid between the intestine and sac; occasionally there is not.

It is well to draw out the bowel beyond the area of constriction and inspect it. If it is reduced first, it will be sometimes difficult and dangerous to pull out a diseased segment of bowel from within the abdominal cavity through a small opening. Hot salt pads are applied until the circulation returns, taking as much time as is needed. The bowel is insensitive to pain; it can be cut or burned without causing discomfort. Traction on the mesentery, however, will cause pain. After injecting a little solution about the neck of the sac, it is tied off and resected, first transfixing it. It is allowed to retract within the abdominal cavity, and Poupart's ligament is sutured to the pectineus muscle and fascia, including in the bite of the needle all tissues down to the periosteum of the pubic bone. The femoral vein is retracted carefully when the first or external stitch is introduced. Two or three other interrupted sutures internal to this as far as the pubic spine can then be easily put in.

Mild Contusions of the Abdomen.

CLOUGH (*International Journal of Surgery*, April, 1921) asks the question, How often is a mild contusion serious? He reports a number of cases, to wit: one of a man who was squeezed by a mine car against a wall. The four doctors who examined this case believed he had only contusion of the back and the abdomen. Five hours later he vomited a little food. Next day he vomited freely a greenish material and complained of some abdominal pain. His temperature was normal, but the pulse at once went up to 106° and then returned to normal. The second night he slept well, with no pain. The second day his temperature was 99° and his pulse 80. General conditions were good. Castor oil was followed by four perfectly normal movements without any intra-abdominal symptoms or any distress.

On the third day temperature was 99° and pulse 84. Fecal vomiting began. Immediate laparotomy showed a perforation of the upper jejunum the size of a lead pencil with peritonitis present. The patient died.

The second case after a fall upon a rock pile from a height of sixty feet was bruised all over, but especially in the left lumbar region. Was diagnosed as suffering from a contused back.

Two hours later this patient vomited food containing a slight trace of blood and was suffering from pain over the left abdomen, with tense abdominal muscles. Five hours from his injury his pulse, which was of poor quality, began to climb. Six hours after his injury exploratory laparotomy was performed. No intra-abdominal lesion was found, but there was much blood oozing from the muscles behind the peritoneum. No kidney lesions were detected. At the autopsy nothing was found but contused muscles in the kidney region, nor was there any gross lesion of the gastrointestinal tract.

The third case was struck on the abdomen by a large falling rock. Medical examination showed nothing characteristic. Five hours later there was some slight vomiting with abdominal tenderness, but not much pain. The vomiting continued and the pulse began to climb. The pain increased. Twenty hours after injury laparotomy was performed. Complete severance of the upper jejunum was found, but no tear in the mesentery. End-to-end anastomosis was done. Four days later the patient died of lobar pneumonia. The author asks as to the symptoms on which we may depend to make an earlier diagnosis of these apparently mild cases.

The history of a blow upon the abdomen or of a squeezing between two hard surfaces is suggestive.

A distended viscus is more prone to rupture than an empty one; therefore, stress should be laid upon the history of eating, of defecation, and of urination. There were several cases of ruptured bladders in which urination had not occurred for a number of hours before injury. A

thin person with a small fat cushion and with unprotected bone edge is much more liable to injure a viscus than is a fat person. The frequency with which serious abdominal lesions occur as a result of being run over by an auto should always place us on guard with such a history.

As to the appearance of vomiting, we have often erred in underestimating this symptom. The only time vomiting is perhaps not serious is when it occurs just at the time of injury. If it appears for the first time several hours or even longer after the injury, it is almost pathognomonic of an intra-abdominal lesion requiring immediate attention. Too much emphasis cannot be placed on this point.

An increase in the pulse rate always means trouble, for in a simple contusion the pulse will not rise some hours after the injury. However, great stress must be laid upon the fact that, in the face of most serious lesions, there may be no change in the pulse from normal for several days, or until sufficient time has elapsed for general peritonitis to develop. The combination of vomiting and increased pulse rate should practically always be a signal for radical measures.

Increasing abdominal pain with continued tenderness and rigidity also helps to clear up the picture of a serious lesion.

The absence of blood in the urine or a record of several bowel movements should not steer us away from other symptoms of greater magnitude.

If we give the patient the benefit of the doubt and immediately open every abdomen showing any suspicion of trouble within, we will occasionally save a life which otherwise might be lost, and at the same time do no damage to those who show no intra-abdominal lesion.

Finally, neither the watchword of one of our political parties ("Watchful waiting") nor the text applied to this paper ("And the Next Day") can be used in handling these cases, for the best results will be attained only when we throw aside our ideas of conservation and get in on these cases early, before serious damage has been done within the abdomen.

Intermittent Hydronephrosis.

BREWER (*New York State Journal of Medicine*, May, 1921) reports a number of cases of interest, in the study of which it is evident that in most instances the symptoms were simply those of an intermittent hydronephrosis from any cause; and as, in the early days of the surgery of the kidney and ureter, calculus was the most frequently recognized cause of obstructive disease, it is not surprising that calculus, somewhere in the upper urinary tract, was the preoperative diagnosis in the majority of instances.

While we are all aware that a sudden complete blocking of the ureter in any part of its course gives rise to a group of symptoms which are characteristic and rarely simulated by any other condition, consisting of severe paroxysmal pain radiating from the flank downward along the course of the ureter to the groin, bladder, glans penis, or testicle in the male, and to the labium or urethra in the female, frequently accompanied by vomiting and often suddenly relieved and followed by an abundant enuresis, it must be remembered that if the obstruction is incomplete the pain may be less severe, fixed, and often confined to a small area, as the upper right quadrant, or the region of McBurney's point, and may thus simulate the pain of a gall-bladder or appendix colic. Brewer states that in at least one-third of the cases of ureteral calculus on the right side upon which he has operated, there had been performed a previous operation for removal of the appendix or an exploration of the gall-bladder, and the author pleads guilty of himself having operated on two such cases.

In cases of subacute hematogenous infection of the right kidney, the chances for error in diagnosis are even greater, as the paroxysmal and radiating character of the pain is less marked, and there is almost always a rise in temperature and a polynuclear leucocytosis.

It is well always to keep in mind this frequent source of error, and in all doubtful cases to search for red cells in the urine, examine for the presence of costovertebral tenderness, and if possible secure an x-ray plate.

Reviews

NUTRITION AND CLINICAL DIETETICS. By Herbert S. Carter, M.A., M.D., Paul X. Howe, M.A., Ph.D., and Howard H. Mason, A.B., M.D. Second edition, thoroughly revised. Lea & Febiger, Philadelphia, 1921. Price \$7.50.

In the space of a little more than 700 pages the authors of this excellent manual have placed a very large amount of valuable information dealing with the subjects named on the title-page of the volume. In the present edition they have paid particular attention to the chapters on energy, metabolism, and digestion, and have added a practically rewritten chapter on vitamins and one on metabolism in pregnancy and lactation, with still another dealing with the feeding of children over two years old. So, too, in Part IV they have increased the amount of information as to the subject of dietetics in disease in adults, and from time to time have stricken out material which the advances in dietetic science seem to render useless at this time.

Important topics contain references to standard medical literature in foot-notes.

We note with interest what the authors have to say in regard to alcohol as a food. They reiterate what we all know, that it is capable of yielding energy and, therefore, to some extent, substitutes fats and carbohydrates and spares proteins. As it is not converted into sugar by the diabetic, it is to him a source of energy. The authors straddle the question of the dietetic value of alcohol by stating that it is a bone of contention between those advocating its use in general and their opponents, but they immediately go on to state that studies of the food value of alcohol have shown that from 90 to 98 per cent of it when ingested in small quantities is oxidized, and that the addition of the equivalent of 500 calories in the form of alcohol, or 72 grammes, to a standard diet is practically identical with the addition of an equivalent amount of sugar. Finally, they admit that small quan-

ties of alcohol have been demonstrated quite clearly to serve as a food. As to the value of wines and malt beverages, they do not express any definite opinion.

Once more, therefore, we have published a book, founded upon scientific fact, which asserts that alcohol has some value in medicine.

THÉRAPEUTIQUE CLINIQUE. Edited by Dr. Alfred Martinet. I, Agents Thérapeutiques; II, Techniques Thérapeutiques; III, Traitement des Symptômes; IV, Traitement des Maladies. With the collaboration of MM. Desfosses, G. Laurens, Léon Meunier, Lomon, Lutier, Martingay, Mougeot et Saint-Cène. Masson et Cie, Paris, 1921. Volumes I and II.

These two volumes are complementary to Dr. Martinet's Diagnostic Clinic, as it is called; in other words, they may be considered as a second part of that rather encyclopedic work dealing with diagnosis. His Diagnostic Clinic, the third edition of which appeared earlier in 1921, discussed the methods of examination and the symptoms which are to be studied by physicians in the diagnosis of disease. It was richly illustrated, many of the figures being in colors, and various parts of it were contributed by able French clinicians.

In Volume I of this supplementary or complementary publication there is a brief introduction as to the study of clinical therapeutics, and after this a few pages are devoted to a classification of medicinal agents, to their doses, incompatibilities, and solubility. The real therapeutic portion of the volume begins with the consideration of medicaments which deal with the circulatory apparatus, in the sense that they are stimulants. We find that under this heading we have digitalis, strophanthus and sparteine, adonis vernalis, camphorated oil, and diffusible stimulants such as alcohol, ether, and the ammonia compounds. A subdivision of drugs affecting the circulation is devoted to a consideration of those

which influence the blood-vessels, first of which is adrenalin, followed by ergot, hamamelis, and hydrastis, and these in turn by the iodides, nitrites, and artificial serums.

It is not possible for us to give the Table of Contents of even one of these volumes. Suffice it to state that after considering the drugs which affect the genito-urinary tract, respiratory tract, etc., etc., there is a consideration of those measures, such as drugs, serum therapy, and vaccine therapy, which can be instituted against parasitic diseases. Dietetic measures are also considered briefly, and there is a chapter of one hundred pages dealing with physical therapeutics, reaching from climatotherapy and hydrotherapy to radiotherapy and heliotherapy, and there is also a consideration of psychotherapy.

The latter part of the book contains a very large number of illustrations showing how various remedial measures may be instituted against pathological conditions not only in the chest and abdomen, but also on the throat and nose, and genito-urinary system.

The second volume is divided into two parts, one of which deals with the treatment of symptoms and the second with the treatment of diseases. In other words, whereas the first volume deals with remedial agents and measures, the second volume names the disease and then proceeds to describe how drugs may be applied for its relief. As this volume contains about 800 pages it is able to cover a very wide field in direct therapy.

Both volumes are ably written and much better paper and print work is present than is commonly employed in many French publications. Those of our subscribers who can read French will find an immense amount of valuable information and numerous practical hints in both volumes, and those who do not read French will nevertheless be able to obtain from the prescriptions and illustrations, which are very copious, many useful points which will be of value to them in practice.

There is such a large amount of surgical

information included that these two volumes will prove almost as useful to the surgeon as to the general practitioner.

PRACTICE OF MEDICINE. A Manual for Students and Practitioners. By Hughes Dayton, M.D. Fourth revised edition. Lea & Febiger, Philadelphia, 1921. Price \$2.25.

The word "Manual" is applied to books of such various sizes that the title of this little volume in no way conveys an idea of its dimensions. It contains a little over 300 pages, and although the leading is good and the type is excellent, it crowds into a comparatively small space a very large amount of information, and is to be regarded by the teacher more in the style of the quiz compend than as a text-book, not that the text is in the form of questions and answers but because it is necessarily abbreviated.

The book is small enough to be carried by a student in his overcoat pocket, or in a large pocket of his jacket.

CANCER AND ITS NON-SURGICAL TREATMENT. By L. Duncan Bulkley, A.M., M.D. William Wood & Company, New York, 1921. Price \$6.

Many of our readers know that Dr. Bulkley possesses very positive opinions regarding the questions concerning cancer in regard to its treatment, particularly as to the influence which diet may exercise upon its development. His statement in his Preface that the results obtained by the medical treatment of cancer far exceed any that can otherwise be secured will strike many of our readers as being a bold one in view of the very strong opinion held by most surgeons that thorough extirpation of the growth and its surrounding tissues is usually to be practiced and that subsequent to operation, radium or the x -rays should be skilfully used to destroy any cells which the operation has not removed. As in his previous contributions on this subject, the author emphasizes his strong belief in the constitutional nature of cancer, opposing to the best of his ability those persons who hold that it is primarily purely local in nature.

In order to make his position clear, when

advocating non-surgical measures, he goes far afield in the discussion of the disease, considering the frequency and geographical distribution of cancer, its relationship to civilization, its histopathology and biochemistry, and then proceeds to its diagnosis and prognosis, with a consideration of metastasis and malignancy.

In his chapter on diet he emphasizes his belief that a low diet and a simple life are preventive measures against the development of the disease; or, to use his words, proper diet must lie at the bottom of all effective medical treatment.

Finally, quite a long chapter is devoted to x-ray and radium treatment.

URINARY ANALYSES AND DIAGNOSIS BY MICROSCOPICAL AND CHEMICAL EXAMINATION. By Lewis Heitzmann, M.D. Fourth edition, enlarged and revised. William Wood & Company, New York, 1921. Price \$4.

This is one of the largest and most exhaustive books upon this subject, as it contains more than 350 pages with a copious index, and covers, as its title indicates, the whole subject of urinary examination. It opens with pages devoted to anatomical and physiological considerations, and naturally discusses after this the normal constituents of the urine as well as the abnormal from the chemical standpoint. After this are the chapters upon microscopical examination and upon substances which appear in the urine from extraneous sources. Adequate attention is paid to the condition of the urine in diseases of the renal pelvis, and also of the changes produced in this section by diseased conditions of the bladder and the sexual organs.

Lastly, so far as the general text is concerned, there is a special chapter upon the determination of the functional efficiency of the kidneys by Dr. Dannreuther. Considering the large amount of space that is devoted to other topics we regret that a greater amount has not been given to this very important subject which is constantly attracting more attention, and which is rapidly attaining a position of importance which threatens to make ordinary urinary

examinations almost trivial in some cases. The phenolsulphonephthalein test is, of course, discussed, as is also the indigo-carmin test, to which the author, apparently, leans favorably. The phloridzin test and the methylene-blue test are also given, but the method which has been so strongly urged by Mosenthal and his fellow-workers seems to have been entirely overlooked. Nevertheless, as we have already said, the book is a good guide for the microscopical and chemical studies, which it adequately discusses.

THE ALLEN OR STARVATION TREATMENT OF DIABETES. By Lewis Webb Hill, M.D., and Rena S. Eckman. With an introduction by Richard C. Cabot, M.D. Fourth edition. W. M. Leonard, Boston, 1921.

Some of our readers will recall that we have noticed each previous edition of this excellent little book. In the space of less than 150 pages the authors give a concise description of the so-called Allen method of treating diabetes, with detailed directions as to the diet which is to be instituted day by day, the quantity of the foodstuffs being expressed not only in ordinary measures, but in the metric system as well. The book also contains a very considerable number of recipes for the preparation of simple foods which diabetics can take without disadvantage. Whether it is wise to put the book in the hands of patients is questionable. For the busy practitioner, however, its possession we consider to be practically essential.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. For the use of Students and Practitioners. By Oliver S. Ormsby, M.D. Second edition, thoroughly revised, illustrated. Lea & Febiger, Philadelphia, 1921. Price \$10.

We think it may be said with truth that the first edition of Dr. Ormsby's book upon Diseases of the Skin was received most favorably by his fellow dermatologists. The second edition bears evidence of having been in reality thoroughly revised, and is more copiously illustrated than ever, containing 445 engravings and 4 plates. One of the chief difficulties with many other

books dealing with dermatology is that they are written in such a way as to be useful only to those who are already skilled dermatologists, with the result that the general practitioner, or the student, who attempts to study dermatology from their pages finds himself swamped by technicalities and concludes that the difficulties in the study of dermatology are too great for him to tackle, the more so because the importance of dermatology to the general practitioner seems comparatively limited. Dr. Ormsby's pages show that he has recognized these faults in other works, and without in the slightest degree impairing the scientific spirit of his contribution, he has succeeded in leading the reader step by step to the consideration of his subject by dealing clearly in the earlier parts of the book with the fundamental facts which are necessary if a clear conception of diseases of the skin is to be obtained.

Naturally in presenting a book which contains nearly 1200 pages he has deliberately made his contribution to medical literature an exhaustive one, and therefore deals freely with many diseases of the skin which are rarely met with. A noteworthy fact for the average man is that the illustrations are remarkably good, which is rather unusual in books dealing with diseases of the skin, since it is difficult at times to represent skin lesions by either black-and-white or colored plates. Another characteristic of the book which will appeal to the general practitioner, as well as the specialist, is the inclusion from time to time of prescriptions which the author believes to be useful in the conditions which he describes.

THE DIAGNOSIS AND TREATMENT OF INTUSSUSCEPTION. By Charles P. B. Clubbe, L.R.C.P., M.R.C.S. Second Edition. Henry Frowde, Hodder and Stoughton, Oxford University Press, 1921.

This book, the author states, is based entirely on experience gained in treating two hundred and twenty cases of intussusception in the last thirteen years. It aims chiefly at being practical, and deals mainly

with diagnosis and treatment, irrigation and its limitations being especially noted

The author gives a bibliography dealing with the principal papers on this subject, and states that 98 per cent of these cases start either at the ileocecal valve or at the lower end of the ileum. Special emphasis is laid on the need of careful examination and the importance of the history. The treatment indicated is always that of laparotomy. In 253 cases operated on by the author the bowel had to be resected sixteen times. In the sixteen cases of resection there were only two recoveries.

This is an excellent and instructive record of an extraordinarily large clinical experience.

TREATISE OF FRACTURES IN GENERAL INDUSTRIAL AND MILITARY PRACTICE. By John B. Roberts, A.M., M.D., F.A.C.S., and James A. Kelly, A.M., M.D. Second Edition. Illustrated. J. B. Lippincott Company, Philadelphia and London.

The call for a second edition of this book is abundant proof of the estimate in which it is held by the profession. The authors have embodied in their text the lessons learned in the world war and accepted the dogma that early mobilization and massage are of value in restoring function and contour in fractures of shafts and joint-ends of bones. They reject Lane's teaching to the effect that closed fractures require routine fixation with buried steel plates. They regard with renewed enthusiasm suspension traction treatment of fractures of the femur and tibia and insist upon critical, intelligent and frequent examination of fractures instead of a too absolute reliance on radiographic interpretations by inexperienced laboratory workers.

There has been a general revision of text. They insist upon reduction under general anesthesia; belief is expressed in ambulatory dressings, the value of opium or bromides as supplementary to traction treatment, and in Buck's traction method.

The subject-matter is logical and adapted to easy reference. Considerable space is given to the operative treatment of closed

fracture. The joint method of applying traction direct to the bone has scarcely been given the attention which its importance as an efficient means of treatment deserves. The illustrations are excellent and helpful. The text is clear and convincing. The methods described and advocated are those which have received the indorsement of those clinicians most skilled in the treatment of these injuries.

Obstetrical Fractures receive due consideration. There is a final chapter upon Industrial and War Fractures.

This is a useful book to one who is either frequently or occasionally called upon to treat such conditions.

Correspondence

The Use of Guaiacol in Malaria.

To the Editor of the THERAPEUTIC GAZETTE.

SIRS: In your June 15, 1921, issue, page 399, appears an article "The Use of Preparations Other than Quinine for Malarial Infection," in which no mention is made of the external use of guaiacol. The latter is a specific, or nearly so, for the disease, much nearer a specific than is quinine. In 1899, after the Spanish-American War, I showed before the Chicago Medical Society a number of boys infected with malaria who had been treated in the best hospitals in this country who were not benefited by quinine, and who would have died had it not been for discovery of the specific value of the drug mentioned.

My findings were published in *Merck's Archives* and were quite extensively quoted throughout the country, and scores of doctors from different parts of the United States wrote me that they saved many boys by the use of guaiacol applied freely externally.

Very truly,

CHAS. J. WHALEN, M.D.

CHICAGO, ILL.

Notes and Queries

Spelling of Chemical Terms.

In an editorial on this subject the *British Medical Journal* of April 9, 1921, states that the progress of chemical inquiry, which is constantly bringing to knowledge new substances and new theories as to the constitution and relations of various classes of substances, is apt to cause confusion in nomenclature, especially in spelling. The Chemical Society, which publishes abstracts of chemical papers published elsewhere than in its Transactions, and is therefore among the first to feel the inconveniences which arise, issued a short time ago instructions to abstractors, which included directions with regard to spelling of certain classes of chemical compounds. It is directed that basic substances should invariably be indicated by names ending in *ine*—as aniline, not anilin. This is in accordance with the practice of the British Pharmacopœia, where alkaloids have a final "e," as morphine, strychnine. The Chemical Society directs that the termination *in* should be restricted to certain neutral compounds, such as glycerides, glucosides, bitter principles, and proteins—as, for example, palmitin, amygdalin, albumin. This rule applies to vitamin, which should be so spelt—that is, without the terminal "e." It is further directed that compounds of basic substances with hydrogen chloride, bromide, or iodide should always receive names ending in *ide* and not *ate*, as morphine hydrochloride and not morphine hydrochlorate. This rule is, we believe, now generally followed in medical writings. Another rule relates to hydroxyl derivatives of hydrocarbons, which should be designated by names ending in *ol*. Alcohols should be spoken of as mono-, di-, tri-, or n-hydric, according to the number of OH groups. Compounds which are not alcohols, but for which names ending in *ol* have been used, are to be represented by names ending in *ole*, if a systematic name cannot be given—thus: anisole, not anisol; indole, not indol.

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Original Articles

Diphtheria Immunization

BY J. ALLEN JACKSON, M.D., SUPERINTENDENT

AND

R. J. PERKINS, M.D., ASSISTANT PHYSICIAN

State Hospital for Insane, Danville, Penna.

It has been said that the Schick test is one of the most reliable agents for determining an individual susceptibility to diphtheria, and that an immunity can be acquired in those susceptible by the proper administration to them of diphtheria toxin-antitoxin. Reports of sufficient tests also have been made to warrant us in saying that 12 to 14 per cent of all individuals are normally susceptible to diphtheria. We have failed to find, however, any report of any recent epidemic in a definite locality or hospital that was checked by means of the Schick test and immunization.

During the past year at the State Hospital for Insane at Danville, Pa., we have had an opportunity to study the Schick test and immunization, and although our findings are not distinctly illuminating and convincing, they are possibly worth recording.

During the past three years at this institution, from the early fall to and including the late winter months, there have been epidemics of diphtheria in the female department. There were observed during this period forty-two cases: from June to June, in 1918-19, twenty cases; seven in 1919-20; and fifteen in 1920-21. When the disease made its appearance last fall it was decided

to Schick the entire female population, nurses and patients.

Over eight hundred patients and sixty nurses were tested. Of these we found that the average number susceptible to diphtheria was less than fifteen per cent. The reaction was characterized by a dull-red area corresponding to the vesicle, with a secondary areola which was dusky-red in appearance, turning brown, with a light desquamation, and becoming extinct in about six days. The reaction was read at the end of seventy-two hours, thereby eliminating any possibility of a pseudo-reaction, the latter usually fading within twenty-four hours, and differing from the true reaction in the absence of the secondary areola and desquamation.

Technique.—The skin over the cubital fossa of the forearm is thoroughly cleansed and dried. A graduated hypodermic syringe and needle of about 25 gauge, sterilized, is used. The toxin is mixed with normal saline solution and 0.2 Cc. is injected intradermally into the prepared area. If the technique is properly carried out the site of the injection is raised, blanched, and shows a pitting of the hair follicles.

The control test is made by using heated

diphtheria toxin, and with scientific precision the solution is injected intradermally into the cubital fossa of the opposite arm. If the same arm is used, the two injections should not be closer than two inches.

Immunizations.—Of the total number of cases, five hundred and sixty were more closely studied. Of these 14.9 per cent gave a positive reaction and were therefore immunized; this immunization consisting of three injections of toxin-antitoxin, each injection followed by an interval of from five to seven days. The toxin-antitoxin mixture was used undiluted. The dose of one milligramme was injected subcutaneously into the arm at the deltoid insertion.

Reaction.—These injections were followed by local and systemic symptoms. Within twenty-four hours the arm became swollen and red, the swelling in some instances extending below the elbow. After thirty-six hours the arm was hard and took on a purplish color. This reaction was most marked in individuals between the age of forty and sixty.

The systemic symptoms in some were pronounced. Headache, malaise and temperature elevation from one to three degrees were noticed. The axillary glands did not show any marked enlargement, and the local reaction subsided in ten to twelve days. It was found that these symptoms could be moderated to a great extent by giving a course of calomel and saline twenty-four hours prior to the injection. The treatment consisted of rest in bed and local applications of saturated solution of magnesium sulphate to the part.

Retesting.—After twelve weeks, which is required to establish the immunization, the 14.9 per cent which gave a positive reaction were again tested. Of these, 5 per cent gave a strongly positive reaction and 3 per cent gave a mildly positive reaction. The strongly positive gave a large, distinct areola, and the mildly positive a slight areola beyond the site of the papule.

CASE OBSERVATIONS.

Case No. 1.—Miss S. gave a history of having had diphtheria in December, 1919.

No antitoxin was given at the time, as it was a case in which diagnosis would have been overlooked if not for laboratory findings. In the general routine testing she gave a positive Schick reaction.

Case No. 2.—Miss F. gave a positive Schick test. She was immunized by three doses of toxin-antitoxin. On January 2 she was admitted to isolation with a distinct membrane on tonsils and uvula. Culture positive for Klebs-Loeffler bacillus, and 25,000 units antitoxin given. On February 4, the laboratory reports still being positive, the virulence of organisms found was tested on a guinea-pig, which was afterwards posted. The pig's peritoneum was reddened; abdomen contained a large amount of cloudy looking fluid. Plastic exudate was noted on liver and intestines. A 24-hour culture of the blood serum showed a pure culture of Klebs-Loeffler bacillus. The patient's throat was rather persistent in positive cultures, and tonsillectomy was finally resorted to and cleared up the situation. She was later tested with the Schick test and gave a negative reaction. In this particular case, presumably, sufficient time had not elapsed for complete immunization and in the interval she contracted the disease.

Case No. 3.—Miss A. Schick test October 3, 1920. Result negative. October 15, 1920, developed clinical diphtheria; 25,000 units antitoxin was given and patient made good recovery.

Case No. 4.—Miss E. F. Schicked October 3, 1920. Result positive. Was given two doses toxin-antitoxin. Five days after second dose she developed some membrane on tonsils, which did not spread to uvula. Temperature was normal. After 10,000 units of diphtheria antitoxin was given, temperature rose to 103°. Organism, revealed by test on guinea-pig, showed to be virulent type of Klebs-Loeffler bacillus.

CASE SUMMARIES.

In the summary of these cases we find one patient who in 1919 was diagnosed to be suffering from diphtheria on the laboratory findings, but received no antitoxin,

recovered, and when Schicked gave a positive reaction.

In Case No. 2 the toxin-antitoxin did not have sufficient time to create an immunizing number of antibodies.

Case No. 3 gave a negative Schick and later developed diphtheria. This case might be an exception to a general rule.

GENERAL CONSIDERATIONS.

The facts presented herein show that, in this particular institution, diphtheria has been prevalent in the early fall and late winter for three distinct years; that, in the beginning of a most recent outbreak, the Schick test and immunization were resorted to to control and eliminate the disease; that subsequent to established immunization no further cases have developed in those Schicked and those immunized; that there were, however, three cases which developed during the period of twelve weeks required for immunization, one of which had given a negative Schick, a second case which had had three doses but did not establish an immunity, and a third case which had had two immunizing doses of toxin-antitoxin. Were the immunizations, therefore, responsible for checking the disease?

At first glance an unreserved decision would be given in favor of immunization, but further study shows that of the 14.9 per cent who were immunized, eight per cent on a retest gave a definitely positive reaction. Five per cent of these were markedly positive and three per cent mildly positive, revealing to us that the entire population was not immunized and eight per

cent still remained susceptible to the disease. Had the disease, therefore, run its course?

Then, too, we must consider that during this period a more strict isolation and quarantine was practiced than ever before; that quarantine was adhered to until three consecutive negative laboratory findings were reported; and in a few cases tonsillectomies were resorted to before the area of infection was entirely culture-free from the bacillus of diphtheria.

CONCLUSIONS.

1. Owing to the long period required (twelve weeks) for establishing immunity by the use of diphtheria toxin-antitoxin, the remedy would be of little value in checking an epidemic.

2. In an infected area, where it is impossible to locate and isolate carriers and occasional cases are constantly occurring, it may be of value. The results of our efforts in this respect will be definitely proven within the next year.

3. To insure complete immunization, it is necessary to retest twelve weeks after the administration of diphtheria toxin-antitoxin. In the event the individual still gives a positive reaction, this shows that further time is required for diphtheria toxin-antitoxin to establish an immunity.

4. Fourteen to fifteen per cent of the patients were found to have a positive Schick. Twelve weeks after immunization of these cases by toxin-antitoxin, retesting showed that 8 per cent of the 15 per cent (or 1.25 per cent of the 560 patients) were still positive.



A Diary of Robert Battey, M.D.

BY HOWARD A. KELLY, M.D.

Formerly Professor of Gynecology in Johns Hopkins University, Baltimore, Md.

I was recently called to Rome, Georgia (May 8th), to give the address on the unveiling of the Battey monument, a simple, handsome granite shaft, set up on the main street near the public library. On that occasion I read a letter privately written by Battey from Europe on the event of his attendance at the International Medical Congress of 1881, in London, when Billings also took so prominent a part. This admirable letter I was told has never been published in any medical journal, although it was evidently written for publication. It is a remarkable piece of writing; thrilling with interest in all the important questions which filled the minds of our immediate predecessors.

It is obvious that Battey was everywhere received as *primus inter pares*, and that with his natural great ability and innate Southern courtesy, he proved no mean representative of our country. Although strongly tempted, I forbear any detailed comment on this delightful, refreshing letter, which wafts across the threshold of the twentieth century a fragrant breeze from the near and dear past, when so many of the giants on whose shoulders we stand were in the heyday of their splendid activities.

My Summer Vacation in 1881.

BY ROBERT BATTEY, M.D., ROME, GA.

Worn down by a series of years of professional labor, unbroken by a single month of rest or recreation, the invitation of the International Medical Congress to open a discussion at the London meeting, in August last, afforded me a convenient excuse for withdrawing myself for a time from my daily toil to inhale the invigorating atmosphere of the broad ocean, and recreate a tired brain in pleasant rambles in the old world across the sea, of which I was but too glad to avail myself.

Quartered in one of the officers' state-rooms upon the spar deck, with Prof. W. T. Briggs of Nashville, as whole-souled and enjoyable a traveling companion as heart could wish, I sailed from New York upon the 6th of July in the *Bothnia*, one of the large and staunch ships of the Cunard Line. Drs. Darling, Noegerath, and Pallen, of New York, and Hunt of New Jersey, were of our party, and with Bishop McTyeire of Tennessee, Gov. Bedell of New Jersey, Sir Edward Thornton, British Minister, and Mr. Joel, British Consul at Savannah, helped to while away the long days of an ocean voyage.

Towards the close of the journey, on a stormy day, a rather portly gentleman of New York lost his footing upon the slippery deck and received a heavy fall and dislocated shoulder-joint. The medical officer of the ship, a member of the Royal College of Surgeons, London, failed to recognize the injury when pointed out by Prof. Briggs, and I was called to the consultation. Briggs established the diagnosis by the valuable sign of Dugas of Augusta, of which the M.R.C. had never so much as heard in his London pupilage, and reduced the luxation. The patient was with us again on our return voyage and quite recovered of his injury. So much for the value of Prof. Dugas' discovery.

Having enjoyed the opportunity of seeing St. Patrick in his native bog and of kissing the Blarney Stone to my full satisfaction some years before, we put Briggs ashore at Queenstown for Cork, Killarney, Dublin, and Belfast, whilst I steamed on with the ship to Liverpool.

As it was my especial desire to acquaint myself fully with the latest improvements in ovariectomy, I dispatched Keith at Edinburgh at once, and learning that he had work in hand I took the earliest Caledonian train. Upon my arrival my old friend,

Prof. Alex. Simpson of the University, took possession of me, and at his town house and at Craig Royston, his delightful summer residence by the seaside, rendered my sojourn so enjoyable as quite to reconcile me to repeated disappointments in witnessing anticipated operations.

Simpson is, I take it, about my own age. Endowed with stronger constitution and more self-care he is better preserved and not so frosted by age. He is a true Scotchman and a zealous Presbyterian, and divides most equitably, I think, his heart and his hand between his family, his profession, and his church. Mrs. Simpson, daughter of Wm. Barber, Esqr., a wealthy barrister of Edinboro, is a lady of culture, sprightly and interesting in conversation, full of womanly accomplishments and a devoted wife and mother. She is rather delicate in constitution but yet preserves many reminders of a former youthful beauty. She has three children, fine boys, ranging from two to eight years.

The town house is the former residence of Simpson's illustrious uncle, who here entertained me, with his generous hospitality, when I was an obscure boy, as it were, wandering alone in a strange land. It was here that I was enabled to study for days the temper of mind and the methods of that truly wonderful man, to admire his genius and to catch a spark of his enthusiasm. Those few days mark an epoch in my history which gave direction to much of my subsequent life. In the drawing room hangs a colossal portrait of Sir James, a very admirable likeness, which brought back to me the man and the occasion most vividly and impressively.

During my stay Simpson chanced to have nothing of particular interest for operation. In his wards, at the Royal Infirmary, I saw a case of recent extirpation of the inverted uterus, which was promising well, and several other cases of interest. His senior assistant, Dr. David Berry Hart, is a young man of large head, well filled with brains, which he is daily using to good purpose. It requires no special gift of prophecy to foresee for him a brilliant professional

career. It is not often that I have met a young man who has so much impressed me. He has already done good work and we shall hear more from him in the future.

In company with Dr. A. H. Barber, Simpson's junior assistant, I spent two or three days most delightfully at the country seat of his father near the geographical center of Scotland. Bonskied is the old ancestral estate of Mrs. Barber. It is reached by a three-mile drive from either Pitlochry or Killiecrankie, stations upon the railway. The estate covers a wide expanse of forest of larch, Scotch fir and birch, wild and romantic in its Highland ruggedness, and affords abundance of good shooting ground in the season, which is a source of quite an income to the proprietor. It is watered by two small rivers, the Tummel and the Garrie, which wind about in the dark mountain gorges and here and there take a downward plunge, through broken rocks, in pretty cascades. The Tummel affords good salmon fishing, the evidences of which were daily seen upon the sumptuous table at Bonskied. The Garrie flows through the narrow mountain gorge of Killiecrankie, made memorable by the successful stand of the Scottish hero, Wallace, against the English invaders two centuries ago, and empties into the Tummel near the lower border of the estate of Bonskied.

A writer of the eighteenth century thus describes the historical Pass of Killiecrankie: "It is formed by the lofty mountains impending over the water of Garrie, which rushes through in a deep, darksome and horrid channel, beneath. In the last century this was a pass of much danger and difficulty; a path hanging over a tremendous precipice threatened destruction to the least false step of the traveler; at present a fine road formed by the soldiery lent by government and encouraged by an additional sixpence per day gives easy access to the remote Highlands; and the two sides are joined by a fine arch."

The old stone mansion, planted upon an elevated shelf of the mountains and overlooking a deep, narrow valley, with the

river Tummel and its cascades in the foreground, has been much enlarged and ornamented by the present proprietor, Mr. Wm. Barber. In the grand drawing-room hangs a colossal full-length portrait in oil of the great founder of the estate, Alexander Stuart, progenitor of Mrs. Barber, in his day a very noted surgeon, as well as chieftain and lawgiver of the Stuart clan of Highlanders. He is presented in the full tartan of his clan, and his portly mien and rubicund visage are suggestive of the good cheer and overflowing tankards of pure "Mountain Dew" which characterized his time.

Returning to Edinboro, by way of Perth and Stirling, I found Keith with one of his cases ready for operation. Thomas Keith is a pure Scotchman, plain and simple in his manners as in his dress, affable and kind to visitors, not with an apparent purpose but rather from the natural outflow of a kindly heart. He seems modest, almost to a fault, appears to have no thought for himself, but is deeply absorbed in love for science and in his earnest devotion to the welfare of his patients.

Besides myself, Dr. Rosebrough of Canada, and others, were waiting to see him operate. He expressed, and I am sure he felt, annoyance that he could not get his cases earlier in proper condition for operation, but his stern sense of duty would not allow him to deprive a patient of any favoring influence or condition which could add at all to her prospects of recovery.

The operation was done in a rear room of the fourth story in order to secure the best atmosphere and greatest quietude. A well trained nurse has constant charge of the patient. It was "rather a nasty case," as Keith termed it, and not well suited for display, but all the more instructive for that. Every step of the operation was done with precision and the utmost care and attention to detail. He did not hurry—there was no flourish—no attempt at display. But two ideas seemed to possess the mind of the operator—to remove the tumor and to preserve the life. He evidenced no solicitude for the bystanders and none for

himself. Having seen Keith, talked with him and witnessed his operation, one has not far to go to find the secret of his wonderful success.

At his dinner table I had the pleasure of meeting Yandell of Louisville, Briggs of Nashville, Rosebrough of Canada, Lawson Tait of Birmingham, and others; and hearing him discuss the subject of ovariectomy in detail, I was quite surprised to learn that he had abandoned the antiseptic spray entirely, and that he regarded it not alone useless, but in two cases, at least, the evident cause of death. He had suffered much in his own person also from hematuria caused by the use of the carbolic spray. He employs the carbolic solution for instruments and sponges and esteems it of value. Lawson Tait joined heartily in the condemnation of the spray, and discards the antiseptics of Lister entirely, relying solely upon the most painstaking cleanliness.

I had the pleasure of meeting Dr. Halliday Croom, Dr. Granger Stewart, Mr. Spence and Mr. Annandale, and was privileged to meet the obstetricians and gynecologists at the Obstetrical Society, but I cannot dwell longer upon my visit to Edinboro.

Accepting his kind invitation I tarried a day and a night with Mr. Lawson Tait at Birmingham and became so interested in his work and so captivated by his generous hospitality that I cheerfully yielded to his solicitation to take me another day and night from the Congress in London, during the following week. Lawson Tait, though an Edinboro man, is not so thoroughly Scotch as Simpson or Keith. He is short, thick-set, rather portly in form and c.... (obliterated). He is quick-spoken, quick in action, rapid in thought and prompt in his conclusions. He is a pleasant talker and a jolly companion, and altogether a whole-souled, good fellow. His countenance is striking, full of character, and reminds one a little of Sir James Simpson, whose office pupil and assistant he was for some years. He likes a glass of wine at dinner, if it is old and of good bouquet, smokes a fragrant

Havana after dinner, discusses politics with interest and animation, upon the democratic side, and does not trouble himself greatly about the affairs of the church. He is a member of the Council of his city and an admirer of the great American Republic. Tait is a man of energy and push, has much of the enthusiasm and genius of his great master; and although young as yet, his work is well known to you all. That a bright future is before him can scarcely admit of doubt. Mrs. Tait was summering in the Highlands, so I did not meet her. They have no children.

Mr. Tait showed me many of his cases, and amongst them no less than nine, or ten, of my own operation. The results are excellent. I saw two cases of his operations upon the liver, which greatly interested me. He is certainly making progress in this direction. He opens the abdomen for diagnostic purposes and deals with whatever he may find, with a boldness and dash which are only equalled by his skill and dexterity. To see him do some of these operations is well calculated to elevate the hair upon the head of a timid man. That he meets with professional opposition and is much criticized goes without saying. How would it be otherwise?

Mr. Tait invited me into his operating room at his private infirmary. A case for ovariectomy was upon the table. There were but four persons in the room, all told. Turning to the surgeon, I asked: "Where are your assistants?" "You are enough," was the prompt reply. "With you to help me I will do anything that is to be done. I need no more." A nurse administered the ether, Tait stood upon one side with his instruments at hand, and I opposite. The operation proceeded with the greatest celerity and system. The case proved a complicated one, but was handled with the composure and dexterity of a master. A half-dozen assistants could have added nothing to be desired.

In operating he has the patient well strapped to the table with webbing. A napkin is spread over the face and the ether is steadily dropped, drop by drop, upon the

napkin. No attention is given to the pulse, the breathing is observed and occasionally the napkin is raised for a moment that the operator may see the countenance of his patient and be assured of her safety. Instruments lie in gutta-percha trays covered with pure water. His hemostatic forceps are of his own pattern and made at Birmingham. He uses no carbolic acid excepting at the Hospital for Women, where the by-laws of the hospital absolutely require its use in every case.

The atomizer formerly used by Mr. Tait is the handsomest and most perfect I have ever seen. It is constructed of German-silver, large in its capacity, throws a full, double spray quite three feet off, and will maintain it for three hours. He pronounced it a useless apparatus in ovariectomy and kindly offered it to me, that I might bring it home to America to show my friends "how not to do it."

At the dinner table of Mr. Tait I met, amongst others, Dr. Thomas Savage, of Birmingham, whose gynecological work is well known in this country. I afterwards met Savage in London, but I have to regret that my engagements did not permit me to see more of him and something of his work. I saw just enough to make me desire to know him better. He seems a very quiet, modest and unassuming man, more anxious for the welfare of his patients and the honor of his profession than for his own advancement. The success of his operations, and the manner in which he presents them to the world, amply attest the honesty of his work.

An attempt to give any adequate account of the work of the International Medical Congress would be, alike, beyond my power to do and foreign to the purposes of this random narration of my personal movements and observations. I went to Europe for rest and mental recreation, not to work. My time was chiefly spent in social intercourse with those I especially desired to meet. The task of writing up the Congress has been ably done by others, much more competent than myself, and their

work is freely accessible in the medical journals.

The general meetings were held in the great St. James' Hall, Regent Street, an immense structure, which the more than three thousand members did not half fill. The Congress was opened and closed with appropriate ceremonies by H. R. H. the Prince of Wales, supported by the Crown Prince of Germany, the president, Sir James Paget, and a large number of the medical and surgical celebrities of the world. It was a little mortifying to Americans to see that the eminently worthy, but very modest, president of our national medical body was not invited to a seat upon the platform, whilst others, little known and less respected at home, found their way there. So large was the body, however, and so immense the labor of arranging the details, it was impossible to guard every point.

The Prince of Wales in his personal bearing, and in his opening address, won golden opinions from all sides and was greeted, time and again, with deafening rounds of applause. The address itself was timely, thoughtful and sensible, and was delivered with a quiet self-possession and dignity which commanded the highest respect. It was an agreeable surprise to one, at least, of his hearers. He is rather short in stature, thick-set, with frank, open countenance, a little bald in front and very handsome. The personnel of the Crown Prince was creditable but much less striking. Both of the prospective sovereigns appeared in plain citizen's dress; the German attended by a small body-guard of handsome young men in very elegant and showy uniforms.

Sir James Paget was beyond question the most happy selection possible for the presiding officer. I heard nothing but golden opinions of him from everybody. He seems to have the heart of the British profession as fully—yes, even more fully—than Gross is enshrined amongst us. His address was a masterpiece in its way, lengthy and exhaustive in its scope, and delivered extemporaneously with an earnestness, eloquence and freedom from hesitancy and interrup-

tion quite in contrast with what one encounters in the delivery of very many eminent Britons. The only criticism which I heard made upon him by any of his compeers was that he would persist in giving his opinion for a guinea, the stereotyped fee of a century or more. But this was attributed to his modesty and kindly heart. A prominent surgeon told me that he had sent a lady to him for consultation. He instructed her to provide five guineas wrapped in paper, to ask no question, but put the fee in Paget's hand on leaving. She disobeyed the order and asked the fee. "One guinea," said Sir James. She paid it and carried off the remainder.

I met Paget at breakfast, with perhaps twenty or twenty-five other guests, at his unpretending residence in Hartford Square. He appears to be a man of sixty-five, tall, thin and angular in his build, clean shaved except a slight tuft in front of each ear, with a countenance full of expression but devoid of any pretensions to personal beauty. His form is a trifle stooped, suggestive of humility, which is one of his characteristics, rather than infirmity. He is plain and simple in manner, kind and affable, but dignified and inspiring respect.

Mrs. Paget is a very plain, solid, sensible woman, devoid of personal beauty, frank and communicative. She spoke freely of their early struggles in life, and did not hesitate to tell me that she was a nurse in St. Bartholomew's Hospital whilst he was ward surgeon, and both so poor that they had to toil long and arduously before they were able to marry and support a family. On my left sat a grown daughter and across the table two grown sons, worthy children of so worthy parentage.

Mr. Spencer Wells, the great ovariotomist of the world, with his nearly eleven hundred operated cases, was of course a central figure for me. I lunched with him at his town house, drove with him in his round of calls, roamed over his spacious lawn and gardens at his country seat at Hampstead, consulted with him at the bedside of a wealthy viscountess, but was denied the privilege, which I so much coveted,

of seeing him operate. He had purposely cleared out his cases that he might have leisure for the Congress. He adheres to the carbolic spray, still, in his operations and is constantly improving his results. Mr. Wells is eminently conservative in all he thinks and does, but in no sense is he fossilized. He is a man of sixty or upwards, rather short in stature, stoutly built, but not redundant in flesh, clean shaved, but with scanty side whiskers, an open countenance often lighted by a pleasant, assuring smile. His manner is quiet and unpretending, but self-possessed. He wears glasses constantly. At Hampstead I met Mrs. Wells and a grown daughter. I think he has no son. Spencer Wells has, by his achievements in ovariectomy alone, well earned the honors of knighthood, which Victoria seems a little tardy in bestowing, and his personal fortune I would think ample now to enable him decently to support the title.

Matthews Duncan, little if any my senior, is a handsome, rather portly Scotchman with large head and full of brains. He is a man of mark every way and of distinguished mien which would well befit a gubernatorial chair or senatorial toga. He is the embodiment of aggressive British conservatism, a bold defender of what he conceives to be the right, and a formidable antagonist in the forum of scientific discussion. His influence is as sensibly felt in London as it was upon his native heath at Edinboro. He is always prompt to challenge innovations, and with his ready and skillfully handled rapier he mercilessly evacuates the wind from many a bloated paunch. Perhaps he may be a trifle too conservative and, like our aboriginal neighbor upon the border, may stand so straight as to lean a little backwards, but such men are highly useful to throw their ponderous weight against the many lighter minds whose zeal for progress leads them to the opposite extreme.

In 1859 I met Duncan at Edinburgh and enjoyed his kind hospitality. He was then a vigorous young lecturer upon obstetrics and diseases of women in a side school of

medicine, and gave promise of the distinguished reputation which he has since achieved. He had been the office assistant of Sir James Simpson, conducted the experiments which developed the grand discovery of the anesthetic properties of chloroform, and aspired to a share with his great master in the honors bestowed. Dr. Duncan freely extended the hospitalities of his home. I dined with him on Friday, with other guests, met Mrs. Duncan, but none of the children. When I called to take leave the doctor and family were gone to the Highlands for the summer.

On Wednesday I dined with Dr. Playfair, meeting around his hospitable board Marion Sims, Fordyce Barker and Pallen of New York; Schlavanski of St. Petersburg; Simpson of Edinboro; Kidd of Dublin; Malines and Savage of Birmingham, and others.

At the dinner table of Dr. Grailey Hewitt I met a number of English and American acquaintances and Dr. A. Martin of Berlin. Hewitt is a man of sixty, say, rather less than medium height, a little thin visaged, quite precise in dress and manners, and one would take him for a ruling elder amongst the Presbyterians of New York rather than an Englishman. To me was assigned the pleasing duty of leading the hostess to the dining hall. As in duty bound I did my best to discharge the trust, but was painfully conscious of the fact that my friend Pallen of New York or Miller of Chicago would either of them have done it with so much more elegance and ease. Pallen was not far wrong when he remarked that I reminded him of a stripling attempting to wear his grandfather's hat. The windows of the dining hall look out upon a hot-house and grapery, objects of especial regard to Hewitt. In the ripened grapes upon the table we had creditable evidences of his attention and skill. Two grown daughters, who complete the family circle, entertained us with sweet music in the drawing-rooms after dinner, one at the piano, the other with a skillfully handled violin.

The invitation of Dr. Priestly to dinner

I was obliged to decline, as I had previously committed myself to return to Lawson Tait at Birmingham. I met him repeatedly at his office, at my hotel and at the Congress, and came away regretting that I had not the opportunity to meet him socially in his family. Priestly is perhaps fifty-five, rather tall and of medium build, erect in carriage and elastic step. He wears side whiskers; a pleasant, genial smile lights up most agreeably a rather handsome face. In manner he is gentle, polished, and winning. That he must be a favorite with the ladies can easily be seen.

In company with Sims, Yandell and others, I lunched with Mr. Ernest Hart, the editor of the *British Medical Journal*. The grand success attained by that publication is a living attestation of the genius of its editor. Hart is a small man, of middle age, thin visaged, with keen, sparkling eye, clean shaved, rather thin grizzly hair. His temperament is highly nervous. He is rapid in movement, quick spoken, and a capital talker. He wastes no thought upon his personal appearance. Mrs. Hart is a very plain woman, full of intellectual force and an accomplished musician. She has devoted much time to the study of medicine and is still pursuing it. I imagine she is an important aid to her husband in his professional labors. They have no children.

I called upon Sir Henry Thompson, who lives quite near to Mr. Hart. He, too, like Spencer Wells, had thrown aside his work that he might devote his time to the Congress. He showed me his magnificent collection of stones, pointed out those removed from the Emperor Louis Napoleon and the King of Belgium, and exhibited the instruments used with each.

Sir Henry is below medium in stature, thin in flesh, small and narrow in his brain vault, not prepossessing in facial expression, self-assured, and rather patronizing in manner. It is difficult to resist the conclusion that the sources of his unquestioned greatness must be sought in the dexterity of his hand, and fortunate surroundings, rather than in the natural outcome of a broad intellectual endowment.

I dined with Dr. John Williams at the Devonshire Club. He was one of the secretaries of the Obstetric Section of the Congress. Williams is one of the rising young men of the metropolis, plain, practical, industrious. If I mistake not we shall hear more from him in the future.

I lunched with Knowlesly Thornton and saw him do ovariectomy at the Samaritan Hospital for Women. I saw Bantock do the operation also upon another day. Thornton and Bantock are both former assistants of Spencer Wells and have joint charge of the Samaritan since Wells' retirement. They are arrayed upon opposing sides of the spray question, Thornton joining Wells in its advocacy, and Bantock discarding it with Keith and Tait. Both of them are expert operators and secure most excellent results. Thornton, Bantock and Heywood Smith are among the rising young men of London with future before them. Bantock is a very handsome fellow, but Thornton I thought the more intellectual of the two.

One day as I sat in the room of the Obstetric Section, awaiting the opening of the meeting and engaged in quiet meditation, a heavy hand slapped me familiarly upon the shoulder and a deep, sonorous voice asked, "Is this Battey, from Georgia?" "Yes," I responded with surprise, as I rose from my chair and, turning around, confronted a three hundred pound specimen of youthful John Bull. "And this is Milner Fothergill, of London," he continued with a broad, pleasant smile. We shook hands and were friends at once, but the opening of the session soon ended our talk. It was my intention to extend, by a call, my acquaintance with one whose writings I read with such interest and profit, but so much was to be seen and done and the time for seeing and doing was so brief that I was not able to fulfill the purpose.

The entertainments given to the Congress were very numerous and upon a scale of sumptuous grandeur which only the great metropolis of London could offer. I can speak personally of only a few of them. Some of these entertainments were

general and included the entire Congress, others were more select, and a few quite restricted. Of the first class may be mentioned the opening *conversazione* in the gardens of the Kensington Museum on Tuesday evening. My trip to Birmingham prevented my attendance. The concourse is said to have been immense and the evening one of the most enjoyable. The banquet and promenade at the Guildhall, given by the Corporation of London, at a reputed cost of no less than thirty-five thousand dollars, was, of course, a grand affair and very largely attended. Another large gathering assembled on Monday evening at the *conversazione* given by the Royal College of Surgeons in their commodious building, in which the spacious halls and corridors of the great Hunterian Museum, brilliantly illuminated by electricity, offered ample scope for promenade and material for entertainment. The invaluable collections gathered here were also opened for several hours on Sunday, to those who did not see fit to avail themselves of the special religious services at St. Paul's and Westminster Abbey, for which tickets were distributed to secure seats.

Amongst the smaller gatherings I can speak personally of the garden party of Mr. Spencer Wells at his beautiful country seat, Galder's Hill, Hampstead, three miles from my quarters at the Langham, and a similar garden party given by the Baroness Burdette-Coutts, who, it will be recollected, created a sensation not long ago by her marriage with our young countryman, Mr. Ashmead Bartlett, very much her junior. The latter entertainment was marred by an unlucky shower of rain which compelled the visitors to seek shelter in the elegant mansion or flee to their lodgings.

It was my good fortune, at the two especially select gatherings, the Lord Mayor's dinner on Thursday and the Saturday evening reception of the Countess Granville, to find myself possessed of the wedding garment. The Mansion House dinner included a selection of about two hundred guests from the three thousand three hundred members. Amongst the more noted

names, familiar to you all, I may mention: Huxley, Schlavansky, Pantaleoni, Charcot, Esmarch, Erichsen, Sir James Paget, Von Langenbeck, Sir Risdon Bennett, Donders, Virchow, Pasteur, Tarnier, Sir Henry Thompson, Brown-Sequard, Martin, Von Hebra, Sharkey, Keith, Verneuil, Carl Braune, Simpson, and Lister. Of the dozen Americans present the names of Billings, Austin Flint, Bigelow, Fordyce Barker, Goodell, Sayer and Jacobi are familiar to you.

The evening was enlivened by music from the noted band of the Coldstream Guards, posted in an elevated gallery, interspersed by vocal music from professional artists. The ancient ceremonial of drinking the health from the Loving Cup was introduced by the Lord Mayor and followed by the entire assemblage of guests. To me it was novel and impressive.

The reception of the Countess Granville, at the official mansion of the Foreign Secretary, was the most *recherche* affair of the entire week. Besides foreign delegates of supposed eminent distinction, the foreign ministers at court, with their ladies, were included in the gathering. The simple splendor of the polished white marble halls and grand stairway gave a fitting prelude to the chaste elegance of the Countess herself, who stood within the entrance door to the drawing-rooms, arrayed in simple white and covered with sparkling diamonds, gracefully receiving her guests. Earl Granville, too, had left his invalid couch and sat in a chair at the head of the stairway pleasantly greeting the guests as they ascended. The Earl is a handsome man of middle age, but a martyr to that aristocratic, essentially English disease, the gout. Sir James Paget remarked to me that the Countess is very generally esteemed the most beautiful woman in all England. My own taste in such matters quite justified his opinion.

Although surfeited with the feasting of London and well-nigh worn out by attendance upon the Congress, I greatly desired to see the British Medical Association as a distinctive body. I therefore went at once

to Ryde in the Isle of Wight, the great summer resort for Londoners, where the Association had already opened. Here I met with our countrymen, Billings, Toner, Yandell and Pitman of North Carolina, who were moved by a similar impulse. The meeting was but poorly attended, and seemed tame indeed after the grand gathering in London. This was to be expected, but we enjoyed the beautiful scenery and delightful sea-breezes of the island and were diverted by the races of the Royal Yachting Club, under the patronage of the Prince of Wales, then going on at Ryde. In the Association no distinction is made between foreign, certified delegates and ordinary members. We paid our guinea for registering and our guinea for dinner and mingled with the other members. We do things a little differently at home. The dinner did not excel either in quantity or quality, but we made the best of it. My next-door neighbor, a member from Liverpool, was so loud in his complaints and so boisterous in conduct as to be menaced by the police. Pitman and I found our own in quietly withdrawing to our hotel. From the hill at Ryde in full view stands the royal palace at Osborne, where the queen was summering until the close of Parliament, when she goes to Balmoral in the Highlands.

From Ryde I returned to Southampton and crossed the channel with Dr. Pitman and his daughter to Havre and on to Paris, where we found Briggs of Nashville and Howard of Baltimore. I called, of course, upon our countryman, Dr. Edward Warren Bay, of Egyptian fame, who is pleasantly ensconced in Paris. His quarters are very central and he seems to be doing good business. His clientele, he tells me, is chiefly French, not American, as one would have supposed. He maintains a handsome carriage and horses, which he kindly placed at my service. He has at the head of his establishment a polished ebony darkey from Baltimore, who speaks French well and orders the French coachman around with an air of authority and true African dignity, which show that he enjoys the situation.

Marion Sims was comfortably established for the summer with his family in the Rue de Pontieu, quite near the Champs Elysees. It was cheering, indeed, to see him so nearly like himself, so bright and happy and with such returning vigor, after the severe, and well-nigh fatal, illness of the previous winter. Long may his valuable life yet be spared to bless his family, our common profession, and the world at large! In company with Pitman, Miss Pitman and Howard, I dined at his hospitable board, and we passed a delightful evening with his family.

With my personal observations in Paris I will not detain you. I am admonished that this hasty and random sketch has already far exceeded my intention and perhaps wearied your patience. The length of my tether from home was drawing to a close, so I hastened back to England to fulfill an engagement, accepting the hospitalities of Lord Holmesdale at his country seat near Maidstone, which a lucky chance had thrown in my way. Here I spent a delightful week behind the social wall which separates the English aristocracy from the common people. The observations and experiences of that week would give ample scope for hours of familiar chat. I cannot enter upon it here.

From Maidstone to London, and thence to Liverpool, where I met by appointment my companion, Briggs, just back from Switzerland and the Rhine. We re-embarked in similar quarters upon the same staunch ship, the *Bothnia*, for a rather stormy return to America. I paid, as usual, my full homage to the angry old god, Neptune, who was so exacting that the hitherto invincible Briggs found difficulty at times to keep on deck and maintain his gastric equilibrium. Landing in due season at New York, I instinctively drew in a fresh inspiration of the pure atmosphere of American liberty, and returned to my home in the mountains more enraptured than ever with its wild and beautiful natural scenery, and its remoteness from the stiff and heartless forms and ceremonies of the great metropolitan cities of the world.

The Oculo-cardiac Reflex and its Therapeutic Value¹

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The reflex to which attention was called first in 1908 by Ashner (*Wiener Klin. Wchn.*, 1908, p. 1520) presents a great variation in normal and pathological states. It consists in the majority of normal cases of a retardation or slowing up of the pulse within five or twelve beats per minute produced by compression of the eyeballs during one-quarter or a half of a minute. In addition to the cardiac phenomenon the following symptoms are not infrequently observed: headache, vertigo, noises in the head, sensation of heat or cold. The predominant symptom is the bradycardia, which is almost constantly in direct relationship to the degree of the ocular compression. The best procedure for obtaining the reflex is to place the individual in a lying position, the head well rested and the eyes closed. With the pulp of the index-finger compression of the eyeballs is produced by pushing the eyeballs into the orbits. Among the phenomena mentioned above the cardiac manifestations are the most conspicuous. When only the right

is done over the left eye—that is, pressure over the left eye produced a less marked bradycardia than with the opposite eye. Binocular compression gives about the same results as right monocular compression. The average diminution of pulsations in normal individuals is from five to twelve. Curiously enough, in very exceptional cases instead of bradycardia acceleration of the cardiac rhythm is observed.

As to the reflex pathway, in all probability it follows from the eye through the branches of the fifth nerve to the medulla, from which center it reaches the moderators or accelerators of the heart, and according to which of the latter is stimulated, bradycardia or tachycardia will be the result. Such a pathogenesis could readily explain all other phenomena concurrent with the disorder in the cardiac rhythm.

The investigation of the oculo-cardiac reflex was conducted in a large number of the following pathological conditions: Hemiplegia, epilepsy, paralysis agitans, Graves's disease, multiple sclerosis, tabes, and paresis.

OCULO-CARDIAC REFLEX.

Figures indicate diminution of number of pulsations.

Epilepsy, 27 cases.	Tabes, 19 cases.	Paresis, 5 cases.	Paralysis Agitans, 10 cases	Graves's Disease, 7 cases.
5 cases—12. 12 cases—18. 8 cases—20. 2 cases—30.	13 cases—absent. 3 cases—3. 3 cases—3.	2 cases—30. 1 case—33. 1 case—35. 1 case—40.	6 cases—absent. 1 case—5. 1 case—8. 1 case—2. 1 case—3.	3 cases—15. 1 case—25. 1 case—33. 1 case—5. 1 case—absent.
Disseminated Sclerosis, 3 cases.			Hemiplegia, 12 cases.	
2 cases—absent. 1 case—5.			10 cases—absent. 2 cases—10.	

eye is compressed, the cardiac rhythm is more modified than when the compression

In cases of epilepsy (27) the writer found intensification of the reflex; instead of 5 to 12 pulsations per minute, there was

¹Read at the June meeting of the College of Physicians.

a diminution of 12 to 30 beats, more pronounced in females than in males. While the range of rhythm variation is large (12 to 30), nevertheless it was always constant in the same individual during repeated examinations.

Most interesting data were obtained in tabes. Nineteen cases of tabes were repeatedly examined for the oculo-cardiac reflex. The latter was found absent in 13 and decidedly diminished in 6 cases. The decrease of the number of pulsations was three and four. In the cases with abolition of this reflex, the Argyll-Robertson pupil was present. In three cases with diminution of radical pulsations the Argyll-Robertson phenomenon was absent, but the oculo-cardiac reflex eventually disappeared, and then the Argyll-Robertson pupil made its appearance. These facts are highly important from a diagnostic standpoint, as it adds a valuable sign to the group of signs well known, and it may lead to the proper recognition of the disease in its early phases when the pupillary reflexes are still normal. Moreover the abolition of the oculo-cardiac reflex is an indication of an ascending course of the tabetic process showing an involvement of the bulbar sensory roots.

In five cases of paresis the oculo-cardiac reflex was pronounced. Compression of the eye-globes produced a diminution of the number of pulsations from 30 to 42. This is an indication of disturbance along the pathway of the arc reflex from the trigeminalus to the medulla, or from the medulla along the pneumogastric or sympathetic nerve, or else in the medulla itself. Bulbar symptoms are not infrequent in paresis, such as disturbances of secretory function, vasomotor, respiratory and circulatory disorders, difficulty of deglutition.

Ten cases of paralysis agitans were examined for the oculo-cardiac reflex. In eight of them the Parkinsonian picture was bilateral. In two of the eight cases there was no tremor, but the other symptoms were all present, viz., mask-like face, stiffness of the trunk, general attitude, small steps in walking, finally the propulsion phenomenon. The oculo-cardiac reflex in-

vestigated in each of these sub-groups was found totally absent in six of the bilateral cases in which the characteristic tremor was present. It was normal in the two bilateral cases without tremor. It was diminished (2 and 3 pulsations respectively) in the two unilateral cases, more feeble when ocular compression was carried out on the affected side than on the opposite side. If one considers the anatomo-pathological data of paralysis agitans, one finds a diversity of disorders, but their elective localization is bulbo-pontine. The trigeminal nerve, the afferent part of the reflex arc under discussion, enters the pons on the external side of its inferior surface where the middle cerebellar peduncles join it. Disturbance of equilibration, static and dynamic, is present in paralysis agitans; the tremor itself is one of its manifestations. A lesion, therefore, in the pons, in the vicinity of the nucleus of the fifth nerve (which is the center of the oculo-cardiac reflex), leaving intact the sensorimotor but affecting the cerebello-bulbar pathways, will readily explain all the symptoms of Parkinson's disease as well as the abolition or diminution of the oculo-cardiac reflex.

A very interesting condition was found in the unilateral cases. In testing them for the oculo-cardiac reflex it was observed that not only the latter was more altered on the affected side than on the other, but also the ocular compression increased the tremor on the corresponding side. It seems therefore that the oculo-cardiac center in the mesencephalon is in close vicinity with a center a lesion of which is apt to produce tremor.

Seven cases of exophthalmic goitre were examined. Five presented a marked accentuation of the oculo-cardiac reflex; the number of pulsations decreased 15 to 38. One case without exophthalmos presented only a slight diminution of the pulsations (5); in the remaining case the reflex was absent. Here the manifestations of Graves's disease were exceedingly slight. The interpretation of the alterations in the number of cardiac pulsations can be here explained on the basis of different states of the pneumogastric and the sympathetic nerves.

Ordinarily in Graves's disease there is a hyperexcitability of both nerves (as proven by administration of pilocarpine and adrenalin). According to the researches of Eppinger and Hess some cases react to substances that are apt to modify the function of the vagus such as pilocarpine, producing the following symptoms: salivation, perspiration, flushes of heat, and peristaltic movements of the gastrointestinal tract. In other cases of Graves's disease the above reaction is absent, but under the influence of adrenalin, which is a modifier of the sympathetic function, it produces tachycardia, glycosuria, and polyuria. In a third series of cases we find a combination of both groups of phenomena in the same case; we have then a form of Graves's disease which is both vagotonic and sympathicotonic. According to the degree of hyperexcitability of each of the nerves the oculo-cardiac reflex denotes a diminution in the excitability of the pneumogastric nerve without any alteration in the state of the sympathetic nerve.

Three cases of multiple sclerosis were examined. In two the oculo-cardiac reflex was absent. In one the reflex was present and without any alteration. Considering the variability in the localization of the lesions in this affection the diversity of the oculo-cardiac reflex is readily explained. There was undoubtedly a plaque of sclerosis in the medullary center of the reflex arc in the first two cases and no lesions whatsoever in the center, and in the centripetal or centrifugal portions of the reflex arc in the third case.

Twelve cases of hemiplegia were examined with the following results: In eight the oculo-cardiac reflex was absent when tested by ocular compression on the paralyzed side, normal when tested on the normal side. In two cases it was abolished when binocular compression was carried out. In two cases of very mild hemiplegia the oculo-cardiac reflex remained normal. These findings are suggestive not only with regard to the diagnosis of a unilateral lesion of the motor tract, but also to the differentiation of an organic from a functional nervous disorder.

In view of the clinical observations concerning the oculo-cardiac reflex, in view of the associated phenomena observed during the ocular compression, in view of the pathogenesis of the reflex in which the medulla is considered as the center of the reflex, the question arises whether alterations in the function of the various portions of the reflex arc as obtained by ocular compression could not be utilized in the treatment of some manifestations having its origin in the medulla. With this idea in mind the writer attempted to modify tachycardias, tremor, hiccough, persistent sneezing, hysterical paroxysms, phenomena of thyroidism.

In *anxiety neurosis* the patients not infrequently complain of paroxysms of tachycardia. Five such cases were kept under observation. Besides the mental attitude the tachycardia was particularly distressing and indeed intensified the patient's hypochondriacal ideas. The patients (four females and one male) were instructed during the attacks of cardiac palpitation to lie down and with the index-finger compress both eyes during a half of a minute. Relief was obtained in every instance. The pulsation decreased considerably and remained so for several hours until the next attack. The success was so striking that the patients never failed to have recourse to ocular compression as soon as the attacks of tachycardia made their appearance. They learned through experience how deep the compression should be made in order to obtain satisfactory results. It is to be borne in mind that in each of the five cases there was no organic lesion of the heart.

The ocular compression did not remove the cardiac neurosis, but whenever the cardiac irritation made its appearance it diminished considerably the precipitated heart action and not only gave subjective relief but also exercised a sedative action on the cardiac muscle. The total disappearance of the cardiac phenomena took place only when the anxiety neurosis through other therapeutic channels was removed. The beneficial effect of the ocular compression was strikingly evident.

The same experience was observed in

paroxysms of tachycardia in seven cases of *hysteria*. Two of them were particularly pronounced. The patients' pulsations would reach during the attacks 160 and 180 respectively. Ocular compression succeeded in decreasing the number of beats to 86 and 72 respectively. In the entire group the oculo-cardiac reflex was utilized to the greatest advantage. The patients learned how to produce it and to what extent to press the eyeballs into the orbits.

Of special interest the procedure appeared to the writer in one case of *hiccough* and in two cases of *persistent sneezing*. The first case is that of a clergyman who, being of a neuropathic make-up, developed a fear every time he had to deliver a sermon. He trembled, became pale, felt weak. This would last a few moments, after which hiccough would make its appearance. The latter would last several hours, and on several occasions two days. Neither bromides nor opiates succeeded in arresting the distressing manifestations. Ocular compression was resorted to. Surprisingly it gave the patient considerable relief on many occasions, and finally the patient succeeded in arresting the hiccough completely. According to his statement the arrest of the disorder was arrived at after several attempts, and only when he learned how long to continue the compression and how deeply to press the eyeballs into the orbits.

Persistent *sneezing* followed in one case an attack of gripe of six weeks' duration and in the other an acute rhinitis. The paroxysms of sneezing occurred at irregular intervals and lasted from a period of thirty minutes to two hours, with intervals of about five or ten minutes. Inhalations of various kinds, sedatives, local applications, have all been tried during the paroxysms, but in vain. Finally ocular compression was resorted to as a palliative to check the sneezing. It gave surprisingly good results. The patients learned how and how strongly to press upon the eyeballs. At no time was the procedure considered curative, but it was extremely helpful during the attacks of sneezing as it succeeded in checking it very early in the attack. The patient eventually recovered.

Two cases with symptoms of *thyroidism* came under observation. They were females with large goitres. They were subject to attacks of tachycardia with chills and a sense of impending death. A fine tremor of the hands was also observable. Ocular compression was applied in these cases as a tentative measure during the attacks for relief from the vagotonic manifestations, which evidently were related to the dysthyroidism. The method was considered of course as palliative. The very evident relief obtained from it at each attack was too striking to ignore its usefulness, and the patients applied it very skilfully. They learned the details of the manipulation and had recourse to it promptly in the early phase of each attack. The relief consisted of a diminution of the tachycardia, of a lessening of cardiac compression, of a decrease of respiratory movements, which always accompanied the attacks in an exaggerated manner.

One case of tremor was observed in a middle-aged man who was addicted to the use of alcohol in a periodical manner. After an excess the tremor would become markedly increased and last from two to three weeks. Ocular compression during that period without any medication and practiced several times a day considerably diminished the intensity of the tremor and shortened the period of the usual increase: while formerly it lasted from eight to twenty days, with ocular compression the tremor would disappear at the end of two or three days. The beneficial effect of the procedure was self-evident.

A young girl of nineteen suffered from various phobias, particularly from fear of becoming insane. One of her sisters was committed to an institution and her father had outbreaks of depression. She was employed as a bookkeeper and worked with great application. She suffered frequently from headache, and when the latter became intense there would be also dizziness. It is the latter symptom that led her to the idea of "losing her mind." She read a good deal on the subject of mental disorders in popular books. In view of the family history she developed the above

mentioned phobia. Every time the headache and dizziness would make their appearance, the patient would be thrown into a state of panic, her heart would palpitate with great rapidity, and the patient would feel oppressed. At that juncture ocular compression was resorted to, not with the expectation of removing the severe headache, but of relieving the tachycardia. Each such an attempt proved to be successful. The decrease of the heart-beats was from 120 to 86, and later to 72. The psychic effect of the latter improvement was very satisfactory, as it enabled the patient to remove the idea of an existing cardiac affection which she entertained for a long time prior to the use of ocular compression.

The oculo-cardiac reflex is a new acqui-

sition in nosology. In a number of instances it has an important diagnostic value. Its presence or absence may sometimes lead to the recognition of a serious malady in its early phase while other symptoms are still absent. The lesion may be localized in any portion of the reflex arc from the ocular branches of the trigeminus through the medulla as its center, and ending with the pneumogastric or sympathetic nerves. The degree of intensity of this reflex is also an aid to the diagnosis. Finally the therapeutic value of the reflex is self-evident. It is true that the relief obtained during the procedure of elicitation of it in tachycardia and other non-organic disorders may be of psychic origin, nevertheless the improvement is so manifest that its application is not only warranted, but also indicated.

The Treatment of the Various Types of Nephritis

(A Clinical Lecture Delivered at the Jefferson Medical College Hospital, Philadelphia)

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I am presenting to-day for your consideration three cases, each of which represents a type which you will not infrequently meet with in practice. I would call your attention, first of all, to the fact that in only one of them is the word "nephritis" justifiably employed, except it be that its employment has been sanctioned by usage; namely, the condition of a patient who is really suffering from an acute inflammation of the kidneys or true nephritis, whereas the other two patients are suffering from degenerative changes which are persistent, practically incurable, and characterized by manifestations which are peculiar to each of them.

The first case is that of a young man who is suffering from a toxic nephritis not due to the digestion of a poison, but to the development of some toxic agent in his body apparently arising from a severe attack of bilateral tonsillar infection. As he did not

come under observation while the acute tonsillar process was in existence, we have had no opportunity of determining the kind of infection from the bacteriological standpoint, but he states that he was perfectly well until he had this attack of tonsillitis, and that the symptoms which he now presents developed as the tonsillitis approached its close. He is passing less than 12 ounces of urine a day, which is heavily loaded with albumin, and contains hyaline and fine granular casts; but more important still the urine under the microscope shows red blood cells attached to casts and also free. There is, however, no hematuria that is observable to the naked eye. There is considerable pallor, some puffiness under the eyes, but no general anasarca. The second sound of his heart is slightly accentuated.

Two questions arise in connection with his case: One, as to the prognosis; and two, as to the treatment. In these cases one

has to be most cautious as to prognosis. Like every other acute inflammation, it may pass away and the kidney may be restored to normal function within a comparatively short space of time. Before it has started on the way to recovery, however, the inflammatory process may become so severe as to result in the development of uremic symptoms with almost complete suppression of urine, and this acute complication may make his state desperate.

So, too, in some of these cases the kidney only partly recovers from the acute inflammatory process and the foundation is laid for a low-grade degenerative change which, possibly, will not develop into a serious state for many years or until some infectious disease once more throws a strain upon these eliminating organs.

When we turn to the question of treatment, in general terms it may be said to consist in masterly inactivity so far as drugs are concerned.

By means of the lantern I show you cross-sections of a kidney suffering from acute nephritis. You notice the changes which have taken place in the Malpighian tufts, in Bowman's capsules, and throughout the entire kidney. Not only is the organ itself swollen, but its cells are swollen, freely desquamated, and fill Bowman's capsules and the uriniferous tubules, so that even if urine was secreted the question would be, How could it find its way to the pelvis of the kidney? In other words, the profuse proliferation of cells prevents secretion not only because secreting cells are destroyed, but because cast off they induce a mechanical block.

When you stop to consider the matter you can readily understand that we have no drug which, taken into the body, can displace these cells or immediately produce new ones to take their place. Recovery will occur, if it occurs at all, by the two processes carried out by nature: one, the removal of the cells which have been destroyed by the inflammatory process as well as the removal of the exudate produced, and the other is the growth of new cells to take the place of old ones. To employ

diuretics is manifestly useless. The best thing for the patient is to permit the inflamed organs to have rest, and this rest is to be obtained by the avoidance of renal stimulation, by the avoidance of too free ingestion of water, and by absolute rest of the body so that there may be a minimum of tissue waste to be eliminated. The old-fashioned, but nevertheless somewhat effective, plan of applying two or three dry cups over each kidney may be resorted to with the hope that it will diminish congestion. If the lungs are perfectly clear, a hot pack may be given every day or every other day, not so much with the idea that the sweating induced will eliminate impurities through the skin as with the conception that it will draw blood away from the congested kidneys and equalize the circulation. If the general hot pack seems oppressive, it may be limited to the middle zone of the body, the hot wet blanket being wrapped around an area bounded by the ensiform cartilage above and the pubes below. The diet should be largely if not entirely a carbohydrate diet, the various starches which are easy of digestion and assimilation being used, and their digestion hurried by adding to them five or six grains of taka-diastase at each meal. It has often seemed to me that the administration of diuretics in these cases was as unwise as is the administration of expectorants during the acute stage of lobar pneumonia. In the latter case the air vesicles are filled with exudate. In the acutely inflamed kidney a similar mechanical condition is present. Here we have an instance where a masterly inactivity in regard to drugs requires more skill than their free administration; in other words, except for the purpose of meeting complications, our motto should be "Let the patient get well."

The second case would ordinarily be called one of parenchymatous nephritis. You notice that the patient is pallid and puffy looking, and that the edema from which he suffers is not limited to the lower extremities, as it often is in cases of ruptured compensation in cardiac disease, but

is almost universal. His urine also contains a very large amount of albumin and many large granular casts. It is below 16 ounces in twenty-four hours. He gives a history that he has been in failing health for six months, but we fail to develop in his history any acute cause for the beginning of his illness. If we could see his kidneys, they would not be red and hyperemic, but would present the picture which is known as the "large white kidney." Here again we would find the secreting portions of the kidney covered with desquamated degenerated cells and many of Bowman's capsules tightly packed with such cells. In such cases the prognosis is not only bad as to ultimate recovery, but it is bad as to the duration of life, since few men presenting the conditions that he does live longer than a year or eighteen months, dying as a result of some intercurrent illness, which attacks them because of their devitalized state, or from uremia, which is associated with complete suppression of renal function. The second sound of his heart is distinctly accentuated and his blood-pressure is about 160 systolic and 110 diastolic. Here again the administration of diuretics must be carefully considered. The free administration of water in the majority of instances does harm rather than good. You cannot expect organs which are incapacitated to eliminate fluid which is swallowed in excess. Only those amounts of water which are necessary to compensate for loss through the lungs and skin and a limited loss through the kidneys are indicated. Large quantities tend to increase anasarca and to induce pulmonary edema.

Many of these patients come to the physician because some acute exacerbation of their condition is the first sign that they have of trouble; in other words, an acute congestion or inflammation is superimposed upon the chronic process already in existence, and this complication wipes out the function, in part or completely, of those portions of the kidneys which are still capable of functioning. Such occurrences account for some of the short illnesses followed by death which are met with in these

patients. The kidneys working upon a narrow margin of safety as soon as they are temporarily impaired by some acute condition precipitate catastrophe.

These conditions too explain why some patients who are apparently exceedingly ill take a turn for the better and rapidly improve as far as their acute manifestations are concerned. In other words, if they survive long enough for the acute process which has been superimposed upon the chronic one to clear up, they may revert to their primary condition and often no one can determine what course is going to be followed in a given case. Here again we should remember that an inflamed organ needs rest, not stimulation. You can no more force such a kidney to function actively by the use of diuretics than you can force a consolidated lung to respiratory interchange by forced breathing.

Here again the use of hot packs, as already described, and the employment of moderate doses of sweet spirit of nitre, to keep the skin active, with rest in bed and a meat-free diet during the acute exacerbation, are essential.

If the physician, after the passage of a number of days, concludes that there has been time for the acute complication and congestion to subside, he may decide that the use of some diuretic is wise. If so, it is usually best not to give the diuretic day after day, but to give it in fairly full doses for one or two days, and if it fails to act to wait for further improvement to take place in the kidneys by natural processes. On the other hand, if it does increase urinary flow, he is not to persistently continue it, but to give the kidneys a couple of days' rest before using the drug again.

We do not recognize as we should that the internal organs need periods of rest just as much as the muscles or brain need periods of rest if they are to functionate properly. Incidentally this holds true of the liver, which if it is stimulated every day will not do as well as if it is stimulated every few days to increased endeavor, and the liver is a very important organ to be considered in cases of renal disease because

it is the most important organ that we have in destroying poisons in the body and in performing other essential physiological functions closely associated with urea formation and still other important factors.

Often in these cases the use of 1/100th grain of nitroglycerin, instead of the sweet spirit of nitre, seems to increase urinary flow not because it stimulates the secreting epithelium, but because it probably dilates the renal blood-vessels, supplies the organs with a greater quantity of blood, and so permits increased secretion.

The use of the various potassium salts in these cases, both of acute and chronic parenchymatous nephritis, is rarely of value and if resorted to should only be employed for a day or two at a time. Diseased kidneys do not readily eliminate potash, and if it is retained it acts as a protoplasmic poison and tends to increase edema and cardiac depression.

The third case is one of so-called interstitial nephritis, and in this condition you remember that the prognosis is quite different, unless the symptoms are very acute, as to the duration of life. Many patients with interstitial nephritis live for ten or twenty years, the process being exceedingly slow and accompanied by a gradually increasing blood-pressure if hypertrophy of the heart occurs, as it usually does. Here again we have no remedy which will entirely arrest the pathological process, but dietary measures and guidance as to methods of life are exceedingly important. In the early stages, and indeed in the middle stages of the disease, there can be no doubt that keeping the blood-pressure within moderate bounds, but not necessarily as low as normal bounds, is wise, by the use of electric cabinet baths, the hot pack, or nitrites. So, too, in these cases the moderate use of the iodides is often advantageous. The patient should be urged to lead a gentle rather than a strenuous life, but unless an examination of his blood shows that it contains an undue proportion of non-protein nitrogen there is in my opinion no reason why he should be deprived of meat, and the old idea that

white meats are less harmful than red meats is completely exploded.

In this connection I have to say a word in regard to the question of salt-free diet in both the acute and chronic forms of nephritis when dropsy is beginning or is present in marked degree. My view is that there is no justification in ordering a salt-free diet unless an estimation of the chlorides in the urine shows that the kidneys are unable to eliminate the chlorides and by their retention induce dropsy. We are learning more and more that in renal disease it not infrequently happens that one or more functions of the kidney are far more impaired than other functions. In one class of case we may find edema and retention of salt with a low non-protein nitrogen in the blood, and in another a high non-protein nitrogen in the blood with free elimination of water and salts.

There is not time to discuss with you the use of the various dye-stuffs like indigo-carmin and phenolsulphonephthalein in determining the functional activity of the kidney, but I would call your attention to the fact that while these methods are valuable they only form one stone in building up the arch whereby you make your diagnosis and determine your treatment. There are, undoubtedly, some cases in which the kidneys seem to maintain their ability to fairly well eliminate the dyes which are used to test their efficiency, and yet retain substances which they should normally pass out of the body.

Last of all, you will recall that cases of chronic interstitial nephritis differ from the other forms in that they are prone to have a polyuria instead of an oliguria, and, therefore, there is no need for limiting the patient's intake of water except to remind him that if he drinks excessively he will give his kidneys that much more work to do. The significance of nocturnal polyuria from which many of these patients suffer is that the disease has induced a high renal threshold, and during the night the patient's kidneys attempt by free elimination of water to carry out solids which during the day have been produced but retained.

Editorial

THE TREATMENT OF EXOPHTHALMIC GOITRE.

No disease has probably been treated by a larger number of operative procedures than has exophthalmic goitre, the treatment varying all the way from the injection of live steam, boiling water, and destructive agents, to ligation of arteries and excision of parts of the gland. There has always been a very considerable proportion of the profession, with large experience, who have insisted that a real rest cure, not a half-and-half one, is of infinite value in many of these patients, the great difficulty being that those of limited means cannot resort to it, and its carrying out in a general hospital is almost impossible.

It has also been admitted by most surgeons of experience that a period of rest in bed prior to operative interference is always desirable, and there is no question that the rest which is insisted upon by the surgeon after he operates is an important factor in the ultimate recovery of the patient. As a matter of fact we are rapidly coming to the view that the thyroid gland in exophthalmic goitre has to be treated in different ways, depending upon the individual peculiarities of the case rather than upon any standard proposition, because in no other disorder of function are the conditions of one patient so widely divergent from the conditions which may exist in another.

In a discussion which was recently carried on in the Clinical Section of the Royal Society in London by surgeons and physicians, we note with interest that no less a person than Leonard Williams stated his conviction that there was no more justification for operating on the thyroid gland than for operating on the kidneys in a case of diabetes, asserting that the worst symptoms of the disease, cardiac, mental, and nervous, were due not to the thyroid but to

the thymus, to which too little attention had been paid in view of the fact that it was enlarged in over 85 per cent of the cases. In other words, he advocates that if either gland is to be attacked by the surgeon it should be the thymus gland.

Kinnier Wilson agreed with Leonard Williams that exophthalmic goitre is not a disease of the thyroid, and we quote these two speakers because doubtless their assertions will seem anything but in accord with the views that are generally held by the profession, relying upon our readers to give them the value they deserve.

On the other hand it is interesting to note that Hector Mackenzie stated that at one time he had been of the opinion that surgical treatment in certain cases was probably the best one that could be resorted to, but later on he became disheartened by the total mortality. Still later when operations on the gland were treated with the aid of local anesthesia he once more revised his position because the results seemed to be as good as they formerly had been bad. He disagreed with those surgeons who advocated ligation of the arteries, not because he thought this procedure was particularly dangerous, but because he had never seen any satisfactory results, and he considers that if operation is going to be undertaken it is not worth while wasting time tying arteries when far better results can be obtained by thyroidectomy.

Concerning the use of the *x*-rays, which are now so popular in the treatment of this condition, Martin Berry spoke of them in high praise, believing that few conditions contraindicated their use except where there was great pressure upon the trachea with nervous dyspnea. Mackenzie, however, while recognizing that the *x*-ray advocates have ground for their contentions as to the valuable effect of the *x*-rays, maintains that many instances in which the

x-rays do good are not well developed, but more in the nature of quiescent cases.

Last of all, from the surgical standpoint, it is interesting to note that Dunhill expressed the view that in those cases in which ligature of the arteries could be done easily it was not necessary, and that in cases in which it might be regarded as quite necessary it was dangerous, believing that under the latter circumstances it was about as easy and safe to remove part of a lobe.

We think that Dunhill possibly sums up the whole subject pretty well when in closing he expresses the belief that there should be only one person in charge of a case of exophthalmic goitre, and this person should be the physician piloting the patient back to health if possible, but in turn calling in the surgeon if it is found that the case is not going on as it should. Generally the surgical procedure to be followed, the nature of the anesthetic, and the extent of the gland to be removed should be determined, of course, by the surgeon who is called in to do the operation, to which we may add the additional statement that whenever possible the surgeon that is called should be one who is skilled in judgment and in technique, by virtue of experience, in this class of cases.

THE PROGRESS OF CLINICAL PHYSIOLOGY.

Those members of the profession who have achieved even a moderate degree of success are forced by reason of the demands made upon their time to give up original investigation if they are active practitioners and to rely upon the results achieved by their more fortunate colleagues who, for one reason or another, are able to devote their time and energies to the development of pure science in its relation to medicine.

For many years, largely because of government subsidy, a large proportion of the results of such work emanated from Germany, but within the last two decades the establishment of laboratories in England and America has resulted in the development of an immense amount of original

research which promises to be of untold value to medicine and the world in general. Indeed, at the present time, both in this country and in England, there are groups of men who have been so fortunate as not only to delve in the realm of advanced medical science with success, but who have had a sufficient breadth of vision to enable them to place their results before their active medical colleagues in a way which proves interesting and valuable. Not the least of these is J. S. Haldane of Oxford, who has contributed to the *British Medical Journal* an address which he delivered before the Edinburgh branch of the British Medical Association. In this address he deals with some recent advances in the physiology of respiration, renal secretion and circulation, acknowledging the assistance, directly or indirectly given him, by a number of other men working along collateral lines.

In discussing the physiology of respiration, he lays emphasis upon the wonderful delicacy of balance which controls this function, pointing out that although a graphic record of his breathing as he spoke would present a picture of hopeless irregularity in every direction, he also emphasized the fact that if the air expired was collected minute by minute, it would be found that the samples varied little in composition. In other words, that breathing is natural in the sense that if it is not interfered with, the mean percentage of CO_2 in the alveolar air is maintained with extraordinary steadiness; far more steadily than in the expired air, because the latter is a mixture of the alveolar air with the air contained in the air-passages as expiration begins. If CO_2 is inhaled or moderate increases in its content induced by muscular exertion, he also found that its quantity in the alveoli was increased only momentarily because the breathing was immediately increased sufficiently to maintain the average CO_2 per cent. This also held true if oxygen was inhaled; in other words, the alveolar content of CO_2 is always kept comparatively at one level, and this level is closely allied with the quantity of CO_2 in the blood stream as it exists in the lungs. The result is that

the CO_2 stimulates the respiratory center to activity, increasing its activity as the CO_2 content rises and diminishing it if the reverse holds true, thereby establishing a perfect balance. To illustrate the extraordinary delicacy of what might be called the respiratory reflex, it has been found that an increase or decrease in the free CO_2 content in the ordinary blood is only two parts by weight in a million of blood.

The interest in the function of CO_2 in the body, however, does not cease here. It will be recalled that Pembrey and Beddard found that in diabetic coma the alveolar CO_2 percentage falls to less than one-third of normal, but returns to normal when the symptoms are relieved by sodium bicarbonate, which is, of course, indicative of the fact, as Haldane says, that CO_2 in conjunction with other acids acts in the regulation of breathing.

Combining the researches of Hesselbach and their own, Haldane and his colleagues have been able to conclude that the reaction of the blood is regulated with a delicacy which is almost inconceivable, since their calculation shows that deficiency of one part by weight of ionized hydrogen in about one million millionth part of blood suspends completely the activity of the respiratory center. It is evident, therefore, that some compensatory mechanism must exist for the control of so delicate a process, and this is obtained by the immediate response of respiration.

Recently Dodds has shown that when food is taken into the stomach there is a rapid secretion of dilute HCl , followed about an hour later by an alkaline secretion from the small intestine. The secretion of HCl results in a temporary excess of alkali in the blood, and this promptly produces a quite marked compensatory rise in the alveolar CO_2 percentage, followed about an hour later by an equally marked fall while the alkaline secretion is being produced. In other words, there is interplay between the digestive and the respiratory functions.

Another point of very considerable interest is that while the urine may vary extraordinarily in its reaction, the alkalinity of

the blood varies scarcely at all, the acidity of the urine being chiefly due to the presence in it of acid phosphate, large amounts of which can be excreted without the urine becoming more than slightly acid.

In connection with the regulation of oxygen pressure in arterial blood, Haldane also points out that the mechanism involved is an exceedingly delicate one and reminds us that Pembrey was the first to show that Cheyne-Stokes breathing in a patient can be abolished by the administration of oxygen, which would seem to be equivalent to a statement that Cheyne-Stokes breathing is always a symptom of want of oxygen. Meakins has emphasized the importance of slight variations in the oxygen content of the blood by pointing out that a continued deficiency of even one part by weight of free oxygen in a million of the blood present in the capillaries may be very dangerous.

Of definite clinical interest is Haldane's description of what he calls the anoxemia of bronchitis, pneumonia and emphysema, and ruptured cardiac compensation. It is in these conditions that he seems to be a hearty believer in the free administration of oxygen-gas by inhalation. It is also interesting to note in this connection that although the lungs are quite as much blocked at the time of crisis in pneumonia as they have been at an earlier date, nevertheless the breathing improves as crisis occurs.

In connection with renal function, Haldane points out that the free drinking of water, while increasing the output of urine, does not materially increase its solid constituents. Furthermore, after free water-drinking, there is no change in the hemoglobin percentage, which is noteworthy, nature taking care that the amount of water absorbed is equaled by the amount of water which is excreted. In other words, the body maintains the water content of its blood with almost the same delicacy as it maintains the CO_2 content, and in those forms of kidney disease in which the ability to excrete salts is impaired, the water is not retained in the blood stream, but in the tissues for the purpose of maintaining their proper tonicity as well as the normal tonicity

of the blood. In some instances there may be dropsy because more fluid is taken in than the water-eliminating power of the kidney will permit it to get rid of, and in other instances it is the inability of the kidney to eliminate salts which produces the general anasarca.

Last of all, Haldane calls attention to the investigations of Krogh of Copenhagen, who found that by microscopical observations of transparent tissues very large areas of capillaries are tightly closed so that no blood or even plasma can pass through them. During activity, however, these capillaries relax and become permeable, thereby carrying an increased oxygen supply to the parts which are active, and recent work in this country, done by Richards, shows that a similar play of capillary activity takes place in connection with the circulation of the kidney, which is equivalent to stating that nature arranges for organs or parts of organs to go into periods of rest alternated with periods of activity, in which, because of their rest, they are enabled the better to functionate.

TOBACCO AND THE HEART.

Physicians are so frequently asked the question as to whether smoking is to be considered harmful that any contribution as to the influence of tobacco when so used is of interest, even if wide divergence of opinion still exists concerning its influence. We believe that a census of the medical profession would reveal the fact that a very large proportion use the weed, and while this is no proof that it possesses no harmful properties, nevertheless its influence cannot be exceedingly harmful or its consumption would not be so popular.

One of the difficulties at arriving at a correct conclusion depends upon the constitution of the individual and upon the question as to whether he uses tobacco to excess, excess in turn being determined by the susceptibility of the individual and the strength of the tobacco which is employed.

If tobacco was as deleterious as some fanatical people believe, an amount of ill

health would be engendered which would be quite sufficient to discourage its employment. It has been claimed by some that it should not be used by those who have an abnormally high blood-pressure on the ground that it raises blood-pressure. By others it has been asserted that it induces functional disorders of the heart, by still others that it causes nervous irritability, and some have even gone so far as to claim that it induces an actual degeneration of the myocardium.

It is interesting to note that most of the contributions to this subject have been made by those who do not use tobacco and who often have been instigated by fanatical antagonism to it. We know of one or two investigations which have been made by others, and they have not, for various reasons, had a sufficiently close connection with the actual smoking of tobacco to have a very definite bearing upon the issue. As in many other instances, experimental results have been misinterpreted or conclusions reached which are not justified by the researches which have been made.

The latest contribution which we have seen has recently been made to the *Ohio State Medical Journal* by Brigham, who carried out an investigation with 132 students at the University of Michigan. Dr. Brigham found that the blood-pressure did not vary much from normal in any class of smokers, thereby opposing the view which we have already referred to, to the effect that it tends to raise blood-pressure. He did find, however, that smoking tobacco increased the pulse-rate, bringing it up to the neighborhood of 90 per minute, and he also states that the length of systole was slightly shorter among smokers than among abstainers. He deduces from this that the drug produces a slight irritation of the myocardium in young men who should have been in the most perfect condition of health.

We see no reason to believe that this is a true deduction. It is quite possible, and, indeed, more probable, that the increase in rate is due to some diminution in activity of the pneumogastric nerves or that it has resulted from a slight relaxation of the

vascular system, whereby the resistance to heart action is diminished, and we cannot help feeling that this author makes a mistake when he goes so far as to conclude that tobacco smoke may be considered an etiological factor in myocarditis.

In the second series of experiments, Dr. Brigham says that the striated muscles of frogs subjected to tobacco smoke fatigued much more rapidly upon electrical stimulus than the muscles of control frogs, and this was not due to the presence of carbon monoxide in the smoke, but to other toxic substances. Here again we do not see that this experiment, however interesting it may be in itself, has much bearing upon the use of tobacco by the human being, whose muscles at no time are exposed directly or indirectly to an infinitesimal amount of tobacco smoke, and it is a far cry from the muscles of a cold-blooded animal to the muscles of man.

The question naturally arises as to whether something may be said in favor of tobacco smoking. When immense numbers of the human race, scattered all over the world, employ any agent constantly in large quantities, and when these human beings vary from those possessed of the highest intelligence to those who are but poorly endowed mentally, it is a fair supposition that the substance which is employed, while it may occasionally be harmful, nevertheless possesses advantages and usefulness. We believe that a large number of those who smoke tobacco find in it rest and comfort, and that this rest and comfort, which may be entirely psychic, tends to lower blood-pressure when it has been raised by severe mental or physical toil.

In some instances the mere act of smoking steadies the processes of thought and by inducing mental rest permits the system to direct its chief energies to the digestion of food, instead of having its energies divided between mental and physical activity on the one hand and digestive processes on the other.

A favorite method of criticism resorted to by the opponents both of alcohol and

tobacco is to state that these substances induce certain changes in the human body, and then to reach the deduction that because these changes occur they are abnormal or harmful. It is a much more reasonable line of argument to hold that the induction of certain functional changes at certain times is definitely beneficial. In the case of alcohol, it may be proved that its use in moderate quantities at times, or constantly, diminishes the ability of an individual to do mental work at the top notch, but this does not prove that it is not advantageous for him to use in moderation a substance which will prevent him at suitable times from continuing to work at top notch.

It was pointed out many years ago that the physiological explanation of the universal habit on the part of babies of sucking the thumb rested upon the fact that by so doing they drew off energy from the vagus centers and so quickened the pulse-rate. So far as we know, such movements on the part of a young infant have never yet been claimed to be deleterious, and while it may be held that the infant uses the thumb as a substitute for the nipple, we believe it can be equally well held that it would be found to be a very poor substitute if the infant did not find a certain amount of comfort in its employment.

We believe that the truth of the whole matter lies in the question as to whether tobacco is used excessively and, in certain instances, wrongly in the sense that it is employed at times when it should be laid aside. Tens of thousands of persons have been deprived of red meat and allowed white meat under the belief that the first was deleterious and the second harmless, although we now know that any such distinction is absurd, and that in many instances of renal disease there is no reason whatever why they should be deprived of any kind of meat, but many reasons why they should be allowed to use it in moderation in order to maintain a nutritional balance. So, too, not rarely tobacco is forbidden a patient when there is really no good reason for depriving the patient of what is a comfort to him.

THE USE OF PITUITARY EXTRACT.

Many years ago when adrenalin, because of its remarkable effects, was attracting the attention of the entire profession, we pointed out in these columns that it was inconceivable for a substance which possesses real power for good not to also possess real power for harm if wrongly employed. The same statement holds true in regard to pituitrin, a substance which, like adrenalin, has undoubtedly become a permanent factor in the materia medica list. Without doubt it is often wrongly employed, and when so used, as it possesses power, it is capable of doing harm, but here the weakness lies with the person employing it and not with the drug itself. It is manifest that to use pituitrin in a case of labor before the os is adequately dilated, or when there is some obstruction in the birth canal, is distinctly dangerous. The reported cases of ruptured uterus under these circumstances is a testimony to the power of pituitrin as a uterine stimulant and not evidence that the drug is dangerous unless used in unsuitable cases.

So, too, with our present lack of knowledge concerning its influence upon the other glands of internal secretion, occasional instances in which its hypodermic use is followed by disagreeable nervous or circulatory symptoms is but another indication of its power and another evidence of the fact that we do not know enough concerning it to employ it haphazard.

Its use to hurry a labor, which nature is making slow in order to avoid damage to the mother or child, is wrong, whereas on the other hand its employment in true uterine inertia in a tired woman with a free birth canal may be exceedingly useful.

Without doubt its introduction has caused many a physician to avoid the use of forceps, and considering that oftentimes these instruments cannot be used by skilled hands and, therefore, often do damage to the mother or child, it is a nice question as to whether the employment of pituitrin even in cases, which are not best suited to

its use, in the end does not do less damage than forceps have in the past.

The whole point in this matter is controlled by the facts stated in our first sentence, namely, that no drug that possesses great power can be used haphazard, but must be employed only when clearly indicated and when the contraindications to its use are practically naught.

We understand that in certain cases when it is thought that a perineal tear may be induced by pituitrin skilful obstetricians now perform episiotomy followed immediately after birth by suture.

NON-OPERATIVE TREATMENT OF SURGICAL TUBERCULOSIS.

After a period of enthusiasm for the surgical treatment of tuberculosis involving bones, joints, glands, or other accessible structures, there has come one of reaction in which even the active surgeon, warned by often tragic experience, has withheld his hand until such time as, for instance, the pus under tension has forced him to procure a mechanical relief to local circulation even at the risk of a possible mixed infection.

The advocates of non-operative measures have year after year been strengthening their position by reports of successful cases. Gauvain (*Lancet*, May 21, 1921), confining his remarks to tuberculous disease of the bones, joints, and glands, in which conditions he states non-operative treatment may be adopted with confidence and reasonable assurance of success, reports on a series of cases observed from 1908 to 1921, this series numbering between 2000 and 3000. Gauvain holds that operative treatment of an active tuberculous lesion is based on a false pathology, except in the cases in which the lesion occurs in a situation where its presence is incompatible with life. A tuberculous lesion provokes a reaction. There is the formation of a zone of resistance about the focus of disease. It appears reasonable to reënforce this natural defence and to diminish the virulence of the attack

of the bacillus and to limit in this way its progress.

In 1908 Sir Anthony Bowlby demonstrated in the clearest possible manner the undesirability of radical treatment in tuberculous disease of the hip-joint when he delivered an address at Nottingham on 900 cases treated at the Alexandra Hospital, with a mortality of less than 4 per cent. His brilliant record was only possible by abstention from major operations in active tuberculous disease and aseptic technique in such minor operations as were indicated.

One point of great importance came out clearly: "tuberculous joint disease is arthritis occurring in a tuberculous patient, and is not merely a joint affection." This is the key-note of, and justification for, non-operative treatment of surgical tuberculosis. It needs the greatest possible emphasis, for even to this day there is too great a tendency to concentrate unduly on the local lesion and disregard the fact that the patient himself has contracted a general disease, of which any particular lesion or lesions are merely local manifestations.

Pure surgery still plays a part in the treatment of bone, joint, and gland tubercle, though in cases of active disease a continually diminishing part.

It is often justifiable to extirpate the smaller tuberculous lesions; operation is occasionally permissible in such conditions as tuberculous disease of the knee-joint in adults where progress by conservative measures is slow and the time factor is of importance; it may be essential for the saving of life under increasingly rare circumstances in almost any situation of the body. It is again indispensable in the correction of ankylosed or other deformities where faulty treatment has permitted such deformities to arise—*e.g.*, a hip-joint ankylosed in a bad position. It may be called for where faulty technique has resulted in secondary infection. But no striking advance has been made in the operative treatment of acute tuberculous bone and joint disease unless bone-grafting of the carious spine be considered as such. That operation is, however, essentially a conservative measure. No attempt is made to deal with

the lesion which calls for such an operation. It is simply an internal method of splinting the spine, designed as a substitute for the instrument-maker's skill. In the majority of cases it is an unnecessary operation provided reasonable facilities are available for treating the patient; in certain cases it has distinct and considerable dangers; in a limited number of cases it presents certain advantages. It possesses one point in its favor in that it is a conservative operation; it is a tangible if tardy recognition of the fact that to immobilize a tuberculous lesion is a better way of promoting healing than to attempt its extirpation; but with increasing appreciation of the value and utilization of properly applied conservative treatment the indications for the performance of this operation should be greatly reduced, to the advantage of the patient.

The psychology and future well-being of the patient have been neglected, yet no one would deny their importance. A normal, healthy, well-cared-for, suitably occupied child is a happy child. He is given full play for natural healthy mental and physical activities. Conversely, it is of obvious assistance to the patient to make him happy and normal, and all means to that end should be encouraged and utilized. The monotony of immobilization, of long-enforced recumbency, of fixation in unnatural attitudes, cries for alleviation.

All child patients should be educated, and manual instruction should play a large part in the scheme, adolescents trained in work suited to their limitations, and adults occupied. In addition, all should be amused and entertained, and shown how to amuse and entertain themselves.

In any comprehensive scheme for the treatment of surgical tuberculosis prevention should play a much greater part than hitherto.

Much more should be done than is being done for the child with the stigmata of tuberculosis, the pretuberculous child, the offspring of tuberculous stock.

Conservative treatment includes consideration of general treatment, involving climatic, hygienic, dietetic, drug, educational,

and other methods which it is desirable to employ, and local treatment, which is concerned with the correction or prevention of deformity and is largely orthopedic in character but subject to those limitations enjoined by the fact that the patient is tuberculous.

As a rule, to which there need scarcely be any exception, tuberculous abscesses secondary to disease of the spine, hip, or, indeed, any of the larger bones or joints, should never be opened. Neither should they be left in the hope that they will be absorbed. As soon as possible after their formation and as early in their evolution as the skill of the surgeon permits they should be aspirated. Occasionally their aspiration may be assisted by the employment of modifying fluids.

Adjuvant methods of treatment have largely increased in relative importance and scope of application in recent years, and represent perhaps the most interesting advances made in the non-operative treatment of surgical tuberculosis.

Amongst such aids are heliotherapy, balneotherapy, chemotherapy, vaccine treatment, and the therapeutic employment of x -rays and other electrical agents. Auxiliary methods are of importance for the patient's general well-being, and are also often directly concerned with his disease; they comprise attention to the teeth, skin, throat, nose, ears, and eyes. These matters are frequently neglected, but demand attention and skilled care. The author also includes under auxiliary methods of treatment a branch institution such as he is fortunate in being able to make use of, where chronic cases not requiring any special treatment may be detained indefinitely, and thus give room at the hospital for more acute patients urgently needing specialized care.

All patients who have suffered from surgical tuberculosis should have the continued advantage of occasional skilled supervision. No special hospital for the treatment of these conditions can be considered complete unless it possesses an out-patient department where discharged patients may be periodically examined, advised, and assisted. Not only is medical help required, but ad-

vice in the choice of occupation and assistance in obtaining suitable employment should be forthcoming. Associated with this department facilities are necessary for sending patients to open-air camps and holiday homes working in conjunction with, and under the management of, the parent institution.

The analysis of 2487 cases shows that 1931 were arrested, 62 improved, 31 unimproved, 123 removed or transferred, 56 died. The proportion of septic cases admitted was, unfortunately, a high one. The majority of those discharged unimproved were septic cases. By "disease arrested" is meant that the disease appeared to be cured, abscesses were absent, sinuses healed, and the patient fit to return home and resume ordinary life.

The mortality percentage was 2.54; of the spine, 3.39; of the hip, 1.71; excluding patients who died from intercurrent disease, the number of deaths directly due to tuberculosis is reduced to 47. Meningitis is the commonest terminal cause of fatality. Spinal caries is not only the commonest, but also the most fatal form of tuberculosis. Ten of the thirteen patients suffering from spinal caries who died from meningitis were under the age of five years, and in many cases death occurred within a comparatively short time after admission. Surgical tuberculosis is more difficult to treat and more likely to produce physical disability and undoubtedly more fatal in the very young than in older children.

SPECIAL FIELD OF NEUROLOGICAL SURGERY.

After some preliminary remarks, admirably worded and based on a sound philosophy, bearing upon the development of this specialty and its relation to the profession of medicine, Cushing (*Ohio State Medical Journal*, May, 1921) takes up in detail some of the questions of neurological surgery to which he has devoted himself in the last ten years.

As to neurosurgical technique, he observes that perfection in the conduct of his

therapeutic measures is as essential for a surgeon as is the technique of laying on colors for an artist or of producing sound for a musician. The most crying need in the early years of this century was for the improvement of our technical methods under the realization that what had sufficed for other organs and tissues, when applied to the surgery of the nervous system was disastrous.

When the idea of a purposeful decompression over relatively silent portions of the brain, conducted, moreover, in areas like the temporal and suboccipital regions where an undue extent of protrusion is checked by securely closed extracranial muscles—when this idea finally took hold, the old explorations which had resulted in a certain measure of relief were resurrected and tabulated as decompressions in our modern sense, which they were not, either in reality or intent.

With the development of a reasonably safe and satisfactory procedure for relieving tension both for cerebral and cerebellar lesions, and one which of itself did not lead to paralyses, these palliative operations began to multiply, and it soon became apparent to all that the accepted views regarding the cause of what was called optic neuritis, resulting in atrophy and blindness in tumor cases, would have to be revised.

The subtemporal and the suboccipital operations are, in the long run, the two most useful procedures in craniocerebral surgery, though, as is true of all operations, they are by no means perfected, and there are right and wrong ways of performing them.

The subtemporal decompression may be employed as a temporizing measure even in the presence of a localizable lesion, but it is of chief value in all unlocalizable cerebral tumors. Naturally, since the bone defect is purposefully made over the relatively silent temporal lobe, the growth may at times be unexpectedly disclosed. In the presence, moreover, of a questionable cerebellar lesion, the existing symptoms being hardly such as to justify the more elaborate and difficult posterior exposure, the measure may be used as an aid to diagnosis. For

the existence of an obstructive hydrocephalus can be determined under these circumstances by a puncture of the temporal horn of the lateral ventricle, a matter of considerable localizing value, though it is to be admitted that in the presence of a hydrocephalus a decompression over the cerebrum gives but slight pressure relief.

The routine operation which may be regarded as of second importance is the combined osteoplastic exploration and decompression. With the bone flap so placed that its base is in the temporal region, the squamous wing of the temporal bone may be rongeured away after the flap is reflected. Though surgeons in the past have sacrificed without hesitation large portions of the calvarium in eradicating tumors, and occasionally this may be necessary even now, yet it is highly desirable that the cranial chamber should be kept as intact as one's skill and the conditions permit. It is also desirable for many reasons that an operation for tumor should be conducted whenever possible in a single session; the old two-stage performances, provided there is careful blood-stilling, are less frequently called for.

The third procedure, the typical cerebellar exposure, is a still more difficult operation and necessitates elaborate preparations and skilful team work if a long series of these measures are to be carried through with a minimal mortality. In this performance the steps are practically the same, whether it resolves itself into a decompression or in the more or less complete removal of a tumor, should one be disclosed. It is a long two-hour operation at best—an hour for the full exposure and another for wound closure—but when tension is great, when there is threatened respiratory difficulty so that a ventricular puncture in the course of the early stages is called for, or when there is a recess tumor which requires long and careful manipulations, or a tumor of the midline which necessitates removal of the arch of the atlas and prolongation of the dural incision down over the spinal canal as far as the axis, the performance may well require an extra hour or two.

There is no field of surgery in which fastidiousness is more essential to success. Imperfections in technique in the course of operations on other parts of the body, where other tissues than those of the central nervous system are concerned, may delay recovery but not necessarily impair an end result. But corresponding slips which compromise the function of the nervous system may sometimes leave mental or other disturbances which are irrecoverable and to which death is preferable.

It is not the number of cases operated on which have made advance in surgery possible, but the detailed and careful analysis of the few, in conjunction with allied laboratory investigation.

Ten or more goitres or hernias treated, or appendices removed, in a morning is not an uncommon record, but none of them is completed in a thoroughgoing sense by one person; the chief surgeon may spend but a few moments at the task—the more essential moments to be sure, and it is remunerative—but it puts him on the basis of that form of specialist whose sole task is to give the final adjustment to the carburetor as a succession of newly-assembled motor cars pass him.

Cushing states that brain tumors are common. Of 182 patients admitted in a consecutive twelve months' service to September 1, 1920, with a diagnosis of presumptive or possible tumor during this period, 54 were not operated on.

The remaining 128 patients were operated on in 160 sessions with sixteen fatalities, giving an operative mortality of 10 per cent, a case mortality of 12.5 per cent, and a mortality of 15.5 per cent for the seventy-seven patients for whom a tumor extirpation, partial or complete, was attempted.

Concerning pituitary disorders Cushing observes that certain practitioners calling themselves endocrinologists have erected an extraordinary structure of symptomatic complexes based on meager facts and a fervid imagination, nor does there seem to be any way of checking these elaborations, which bear about as much relation to the functions of the ductless glands as did the phrenological imaginings of Gall and Spurz-

heim to cerebral localization, and further states that epidemics of this sort from time to time hysterically sweep over medicine, dying out in due course, the more quickly if unmolested.

Cushing believes that when there is a primary pituitary adenoma with enlargement of the sella and signs of implication of the chiasm, the operation of choice is the transsphenoidal one. Properly conducted it is an operation of comparatively low mortality, convalescence is a matter of a few days, and the results are often brilliant for restoration of vision—the main object of the operation—which may be astonishingly rapid. It is not an operation likely to be repeated with equal success in case the adenoma continues to grow rapidly or has already broken down the dural barriers and invaded the cranial cavity. Under these circumstances if the operation is to be done at all it must be from above if there is to be any prospect of preserving or restoring vision. It is very doubtful, however, at an early stage of a primary intrasellar adenoma when the conditions are favorable for an operation through the nose, whether patients should be urged to, or would be willing to, submit to an operation from above, with its admitted high mortality and likelihood of complications. For it is accompanied by a wide exposure of the brain, whose cortex may suffer injury, as may indeed the chiasm itself, and the operation furthermore opens the dural barriers so that further enlargement of the growth finds ready access to the region we would wish to protect.

With primary infundibular tumors surmounting, as they often do, a small sella of normal proportions, the problem is entirely different. Cushing favors, with some modifications, the unilateral osteoplastic frontal operation. In the thirty-four patients with operations of this type (forty-three in number) there have been only two fatalities, the second and third cases. However, in only seventeen of the thirty-four patients was the lesion disclosed, and it could not be satisfactorily dealt with in all of them. In 50 per cent of the cases, therefore, the nature of the lesion remains uncertified.

Progress in Therapeutics

Medical Therapeutics

Water Treatment of Diarrhea in Infancy.

DONNELLY in the *New York Medical Journal* of August 3, 1921, points out that dehydration in infants is shown by the sunken fontanel, the ashen hue of the skin, the retracted eyeballs, and oliguria. He says: This state of dehydration calls for immediate replenishment of water in the infant's body. In the absence of vomiting, and if the dehydration is only slight or beginning, water by mouth usually suffices. When the infant will take water from a bottle or off a spoon, four to ten ounces daily (according to age) between feedings will maintain the water balance. If this method is not practical, water introduced by a nasal tube into the esophagus offers advantages in that it is painless and devoid of danger or of unpleasant after-effects, with the possible exception that irritation of the nares and nasopharynx may occur after the repeated use of the nasal tube. This can largely be obviated by the instillation of liquid petrolatum into the nose before the introduction of the tube and the use of a lubricant with a consistency sufficient to prevent it being easily wiped off the tube by the passage through the nose. White petrolatum serves this purpose admirably. After the tube has been passed into the esophagus, if its free end or the funnel attached to it is held under water, the absence of air bubbles makes certain that the tube has not been passed into the trachea.

When dehydration is definite or extreme, or in the presence of severe or prolonged diarrhea and vomiting, recourse must be had to means other than by way of the mouth for introducing fluid into the infant. Four routes are offered: by rectum (enteroclysis), subcutaneously (hypodermoclysis), intravenously, and intraperitoneally. He has never been able to utilize the rectal

route with the degree of success which is apparently obtained by others. Rectal intolerance is usually established so early that the rectal injections become not only useless but actually harmful by setting up local irritation and reflexes which further stimulate bowel evacuations.

Hypodermoclysis of normal sterile saline solution may be used in threatened dehydration or in those cases in which dehydration is only slight. Two to five-per-cent dextrose (glucose) and sodium bicarbonate solutions may be used, but as their chief value lies in the water content of these solutions they are rarely used. Donnelly prefers the saline, as it is the most easily prepared and sterilized and, unlike the sodium bicarbonate, it does not have the attendant risk of producing sloughs. Saline when sterile is safe. However, hypodermoclysis is undoubtedly a painful procedure, and the amounts which can be injected into small infants fall short of the needs of the average case of moderate or severe dehydration. Only about one hundred Cc. of saline can be administered at a time without causing discomfort to the infant. Larger amounts or multiple injections make the infant restless and irritable—the two things to be avoided in weak and dehydrated infants. In combating dehydration this method necessitates multiple punctures with their attending risk of suppuration, and therefore is not a method applicable for continuous use over seventy-two hours.

Intravenous administration of fluid has obvious advantages. He has used sterile solutions of normal saline, five-per-cent glucose, three-per-cent sodium bicarbonate, and a glucose acacia solution, made up of glucose five grammes, acacia ten grammes, and normal saline, q. s. one hundred Cc. The practical difficulties of entering the in-

fant's veins and the danger of the introduction of large amounts of fluid by the longitudinal sinus have made him reserve this method for the treatment of marked dehydration cases only, where the call for replenishment of the depleted vascular system is an urgent one. When he uses this method, the hair is shaved closely off the scalp covering the anterior fontanel and for an inch beyond. The injection into the longitudinal sinus, which lies from three to five mm. beneath the scalp, is made under the strictest surgical aseptic technique. The injection is made slowly, permitting the sterile fluid to enter by gravity at the rate of three or four Cc. a minute and at a temperature of 110° F. At the first sign of discomfort or marked change in the pulse or respiratory rate the needle is withdrawn, and pressure made with sterile cotton over the puncture wound until all oozing has stopped; then it is cleansed with tincture of iodine and alcohol and a sterile cotton and collodion dressing applied. He has made numerous injections by this method and has not experienced any complications nor serious after-effects; on the contrary, many of his results have been most striking in their beneficial effects. The only contraindications to this method are the various forms of infectious dermatitis, particularly if the scalp is involved.

The use of the intraperitoneal route for the introduction of fluid is a comparatively recent therapeutic measure. In spite of the favorable reports of its use, it was not until he had satisfied himself on the cadaver that the penetration of the flaccid intestinal wall by the needle was really difficult to accomplish, were he willing to make use of this method. He has avoided the intraperitoneal injections in all cases where there was any abdominal distention, as the possibility of penetrating the intestinal wall under such circumstances cannot be denied. Donnelly carried out a series of experiments on guinea-pigs, employing various sterile solutions for intraperitoneal injections, and found them to be without any toxic or local irritant action, when employed in proper amounts and in isotonic solutions. All

fluids injected into body cavities and tissues for the purpose of immediate absorption must be isotonic and made of chemically pure substances. Otherwise, in many instances, abdominal distention, local discomfort, and signs of peritoneal irritation will follow intraperitoneal injections.

Reassured that these injections were devoid of serious risk he began injections in the dehydrated infants and young children. The technique is as follows: After excluding abdominal distention and the possible presence of an overdistended bladder, the infant's arms and legs are restricted while in the recumbent position. The injection is made through the median line just below the umbilicus. The skin about this area is sterilized by the ordinary surgical method of preparation, tincture of iodine and alcohol. The skin and subcutaneous tissues are picked up between the thumb and the index-finger of the left hand. A moderately large (eighteen gauge), short beveled needle about two inches long, connected with a container by a rubber tube, is held in the right hand and inserted with a quick thrust, pointing upward and at an oblique angle, through the abdominal wall into the peritoneal cavity. The right thumb may be held on the needle about three-quarters of an inch from the point so as to prevent too deep penetration. The sterile normal saline solution is then run in slowly by gravity at a temperature of 105° to 110° F. and continued until the abdomen is slightly distended. The needle is then removed and the puncture wound covered with a sterile dressing. Usually one to two hundred Cc. may be given to young infants, larger amounts to older babies. Any evidence of shock calls for immediate withdrawal of the needle and appropriate stimulation. The fluid should not be introduced too rapidly nor in too large quantities, so as to avoid possible embarrassment to the diaphragm and heart. The whole procedure must be done under the strictest surgical aseptic technique.

During the past year he has used normal saline routinely in his intraperitoneal injections with gratifying success. A hyper-

tonic solution of glucose (ten to sixteen per cent) given intravenously after the intraperitoneal injection causes quicker absorption of the saline solution from the peritoneal cavity, and urine excretion increases earlier than otherwise. Normal saline solution is absorbed comparatively rapidly from the peritoneum. Post-mortem examinations on infants who had received intraperitoneal injections from a few hours before death to weeks previously failed to show any evidences of injury or infection of the peritoneum or abdominal viscera.

The advantages of the intraperitoneal method of administering fluid to the dehydrated infant are those which were first pointed out in this country by Blackfan and Maxcy. They are: (1) Administration of large amounts of fluid at one time. (2) The fluid is quickly absorbed. (3) The method is a simple procedure, it is practical, and permits of repeated injections at frequent intervals with minimum risk to life.

As the circulation is replenished with fluid, by whatever method, the dehydration disappears, provided the excess loss by way of the bowel has been lessened by controlling the diarrhea, the infant's general appearance becomes better, the fontanel more full, pallor disappears, there are evidences of better circulation, both general and peripheral, toxicity is lessened, the oliguria disappears, and the whole picture is that of renewed and strengthened vitality. By this means we help tide over the necessary period for readjusting the infant's feeding and gastrointestinal tract.

The Treatment of Seasonal Hay-fever.

WALKER, in the *Archives of Internal Medicine* for July, 1921, states that satisfactory preseasonal pollen treatment yields excellent results in seasonal hay-fever. By satisfactory treatment is meant five or six treatments with a 1:500 dilution of the pollen extract, or, better still, two or three treatments with a 1:100 dilution of the pollen extract.

When preseasonal pollen treatment fails, sometimes benefit results from during-the-

season treatment with pollens and sometimes from during-the-season treatment with an autogenous nasal secretion vaccine. During-the-season treatment with pollens without preseasonal treatment is not very satisfactory, although such treatment for the early type of hay-fever is worth doing provided for some reason or other it is not possible to give preseasonal treatment.

Treatment that of necessity must begin late preseasonally may be continued on through the pollen season with better results than those obtained by during-the-season treatment alone, but with much less beneficial results than those obtained by beginning preseasonal treatment early enough to permit of its discontinuance before the season of pollination begins.

Although in the New England States the pollens of rose and redtop grass occasionally cause early hay-fever, treatment occasionally has to be given with these. The pollen of June grass is a more or less common cause of early hay-fever, but when the season of its pollination is very early, unless the treatment is begun very early, too little treatment can be given for it to be of benefit, and when its pollination is very late sufficient treatment with timothy pollen has been given to protect against June grass pollen exposure.

Treatment with a combination of timothy and June grass pollens was not successful in his hands because of insufficient treatment with both pollens; the addition of June grass pollen retarded the amount of treatment that otherwise would have been given with timothy alone. Another illustration of the undesirability of mixed pollen treatment is noted with those patients who have both the early and the late types of hay-fever. In these cases, during the month of May and part of June, large amounts of timothy pollen extract should be given together with small amounts of ragweed pollen extract, and the result in these cases is rather poor because there is a tendency to restrict the timothy treatment for fear of producing anaphylaxis from the combination of two pollens to which the patient is sensitive. In other words, treatment with a combination

of pollens either diminishes the amount of treatment that is required with one or all of them, or pushing the treatment with the combination leads to the danger of anaphylaxis. For either or both of these reasons he sees no benefit to be derived from mixed pollen therapy. As regards the early type of hay-fever, he considers it best to treat preseasonally with timothy or the chief causative pollen, and if necessary to treat during the season with June grass pollen.

Since intimate exposure to other pollens which may be contributing causes of hay-fever, the eating of fruits during the hay-fever season, the possibility that bacteria play a part in the cause of hay-fever, and the exposure to olfactory irritants, may all aggravate the symptoms of hay-fever, it is not remarkable that hay-fever treatment is not perfect.

Mitral Stenosis, Auricular Fibrillation, and the Action of Digitalis.

In the *British Medical Journal* of April 9, 1921, CATTLE states it has long been known that digitalis slows the heart by prolonging diastole—that is, increasing the resting period. It is the discovery of fibrillation that gives the clue to the reason why digitalis acts so remarkably in some cases, and in others appears to fail. It has a twofold action, slowing the whole heart by stimulating the vagus nerves, and, by a specific influence on the auriculoventricular bundle, blocking some of the impulses proceeding from auricles to ventricles. It is thus clear why in many cases in which the rhythm is normal and regular but little good results from digitalis, and that a great deal of the benefit derived in auricular fibrillation is due to the blocking of many of the disorderly impulses proceeding from the auricles. In this affection the heart is more susceptible to its influence, and there are times when it acts like a specific. It is more successful in rheumatic than in degenerative cases. Many cases of mitral stenosis, when the pulse is regular, do not require digitalis and are better without it. It should, however, be used whenever there

is dilatation, except in acute febrile conditions. After irregularity has set in, whether in the early stages, or in the later ones characterized by edema and other signs of heart failure, the results are often brilliant.

There are many ways of giving digitalis, but for ordinary purposes the tincture is reliable. It is said to lose its potency when dispensed with water, but he has not found this to be a common occurrence. In auricular fibrillation one drachm of the tincture—that is, 10 minims every four hours, or 15 minims every six hours—should be given daily, carefully watching the effect by counting the pulse twice a day by auscultation. After four or five days the heart's rate will begin to fall; in another day or two it will be between 70 and 80, and then the drug must be left off for a few days. When the heart's beats occur in couples, as is sometimes the case, the drug should be immediately omitted for a few days. Other signs of insufficiency are severe headache, nausea, vomiting, and diarrhea. Any of these call for suspension of the drug. After a physiological reaction of this description has been obtained, an attempt should be made to find the daily quantity of digitalis which will keep the heart about the normal rate. Patients can take small tonic doses for months without bad effect if they are instructed to omit the medicine for a few days occasionally. The patient's sensations are a good guide as to whether more or less of the drug is required, and some feel best when the heart's rate is kept as low as 50.

In heart failure from purely degenerative changes, in which the pulse frequently remains quite regular, the effects of digitalis are not so good. In these conditions digitalis should be given in the same doses with the same precautions as he has already advised. Mackenzie states that he has many times attempted to reduce the increased rate of the heart when the rhythm was normal, and invariably failed. This observation certainly applies to all febrile and toxic states. Here the heart muscle is poisoned by the bacillary or other toxin,

and digitalis can have no good effect while this condition remains. It may be useful for the resulting heart weakness after elimination of the toxin. Sutherland obtained reduction of the pulse rate after the temperature had subsided in rheumatic fever. Speaking generally, more good may be anticipated when digitalis slows the heart's action; a longer period of repose is followed by a stronger beat. Cases have been reported in which good resulted although no reduction in rate was obtained.

For pulse irregularities due to premature beats, which commonly cause intermission of the pulse, digitalis should not be given. The drug itself will occasion premature beats, and would certainly aggravate the condition where the tendency already exists. It is not a safe conclusion that because a heart intermits occasionally it is necessarily a weak heart. Digitalis is often wrongly given for supposed "weak heart." Our ideas are certainly clearer than they were ten years ago as to the cases digitalis is likely to relieve and those which it is not.

Infantile Diarrhea.

LOWENBURG in the *New York Medical Journal* of August 3, 1921, advises as follows:

1. Purgative: To be employed if temperature and toxemia are pronounced. Castor oil, or calomel, if vomiting does not yield to a single lavage, to be followed by castor oil.

2. Hydrotherapy.

3. Hunger period for twenty-four to forty-eight hours. During this time give freely of saccharated tea (one grain to a quart) regardless of vomiting and continue same throughout treatment as a drink.

4. Feeding of diluted skim-milk mixture sweetened with saccharin (one grain to twenty ounces) and containing larosan with or without unsweetened cocoa. The skim milk and the larosan mixture may be replaced by Finkelstein's Eiweissmilch if this is available. Carbohydrate is gradually added, preferably cane sugar, and strength of formula otherwise gradually increased.

Larosan, cocoa and sugar gradually are reduced as mixture becomes stronger. Formula may then be boiled with arrowroot or flour ball, pancreatin and bicarbonate of soda may be added. Cereals and vegetables (comminuted) are gradually added.

5. Diarrhea mixture continued throughout treatment.

6. Potassium citrate in large dose if acidosis is marked.

7. Irrigations of one-half to one-per-cent tannic acid solution if stools contain blood.

8. Demineralization and dehydration combated by intraperitoneal injection of saline, or intravenous injection of saline, glucose, or alkaline solutions if acidosis is marked.

[We doubt the value of potassium citrate.—Ed.]

Blood Transfusion via Longitudinal Sinus, with Report of Cases.

In the *Archives of Pediatrics* for April, 1921, LOWENBURG states that four persons are needed to successfully carry out transfusions by this method—two nurses and two physicians. In emergency the thing may be accomplished with less, and the idea not be abandoned because of lack of trained assistants. Team work, however, makes for success. In cases in which hurry is not necessary, the procedure should be discussed previously by those who are to take part in the work. Each is assigned his or her duty, and he or she should rehearse it well in his or her mind. Then the whole should be enacted in pantomime by all the prospective participants together until there is no hitch. The director should be the physician in charge, and all the rest must be submissive to his will and must be cautious to initiate no new maneuver, previously unknown to the rest, during the actual performance of the operation. Such an act may be fatal to a successful transfusion, though not necessarily fatal to the patient.

The infant's body is so wrapped that his limbs are immobilized much after the manner of preparation for tracheotomy. The infant lies prone upon a table of such a

height that the operator, at its head, may work at ease and comfort while sitting. His hands, when resting on the table, must be about on a level with the anterior fontanel, and under no circumstances must his position be cramped so as to cause him to point the needle from above or from below or from the side, but directly from in front of him. One nurse holds the infant's head firmly in the hollow of both her hands with fingers interlocked under its head; hence the head actually rests upon her hands and not upon the table. The palms of her hands are most advantageously placed over the infant's ears. In this position she has a certain leverage, which allows absolute control of the head, which she slightly flexes upon the chest. Her grasp must be firm and her hold steady. In one instance temporary failure resulted from the fact that the nurse, unknown to him, suffered pain from sunburned arms. She was unable to remain still and moved during the most delicate part of the operation.

The other nurse acts as general assistant at the instrument table and passes the blood-filled syringes from the assistant physician, who is stationed at the side of the donor withdrawing blood regularly in 50-Cc. Luer syringes, to the operator who injects the blood into the recipient.

Several needles, at least half a dozen of one-eighth-inch bore, are required. Each needle should contain within its bore a brass wire which must show at both ends to insure patency. A plugged needle may be discovered at the wrong moment and thus delay or spoil the entire procedure. The tip of the needle must be sharp but not too pointed, and the flange must not be too long because the sinus lies so close to the surface that the tip of the needle may be within the lumen of the sinus before the opening in the needle is covered. This may result in subdural or epidural oozing.

In addition there are needed a 10-Cc. Luer glass syringe and two or three 50-Cc. Luer glass syringes. The latter must be provided with special metal tips which will fit accurately into the needle which fits the

10-Cc. syringe. Sterile normal saline solution, sterile one-per-cent sodium citrate solution, iodine, alcohol, rubber gloves, green soap, a good razor, rubber tubing to be used as a tourniquet on the donor, a couple of hemostats to hold the latter in place, gauze and cotton, complete the list of necessities. The syringes and the needles are sterilized by boiling in weak soda solution and not by immersion in alcohol, otherwise coagulation of blood within the syringe or within the needle may ensue.

The area over the fontanel is shaved, although this is unnecessary. It is painted with iodine. The posterior angle of the anterior fontanel is accurately located by the index-finger of the left hand. The 10-Cc. Luer syringe, with the needle attached, is partly filled with sterile saline solution. The tip of the needle is plunged just beneath the surface of the skin exactly in the middle line in the posterior angle. As the tip enters the lumen of the sinus the fact is revealed by the appearance of blood within the lumen of the syringe. Meanwhile the associate physician is filling a 50-Cc. syringe (Luer) with the blood of the donor. The physician at the head of the child keeps gently pushing and pulling the plunger of his 10-Cc. syringe in and out, thus preventing blood coagulation and keeping patulous the lumen of the syringe and the needle. A nurse meanwhile sprays ether or ethyl chloride upon the barrel of the 50-Cc. syringe into which the blood of the donor is being drawn. As this syringe is filled, it is disconnected from the needle, which is allowed to remain *in situ* in the vein of the donor. The nurse passes this blood-filled syringe from the associate physician to the operator, who disconnects his 10-Cc. Luer syringe containing the saline, allowing the needle, the tip of which rests within the lumen of the sinus, to remain *in situ*. This needle is steadied with the operator's left hand. The blood-containing 50-Cc. Luer syringe is quickly connected with the needle, and the plunger is gently but firmly and continuously pushed home. Meanwhile the associate physician at the

donor's arm is filling with blood another 50-Cc. Luer syringe, previously washed out by the nurse with the sterile citrate (1-per-cent) solution. He finishes the filling of his syringe just as the last drop of blood has been delivered by the operator into the lumen of the sinus. The operator rapidly disconnects, hands the emptied syringe to the nurse as she passes him another 50-Cc. Luer syringe filled with blood given her by the associate physician. This movement between the three must be harmonious. While both physicians are now preoccupied, one at the donor's arm and the other at the infant's head, the nurse is washing out quickly but thoroughly with the citrate solution the soiled syringe just handed to her. Thus this action between the three is maintained until 150 to 250 Cc. of blood have been injected into the recipient. The amount varies according to the age and size of the infant, and the severity of the case. Needles are withdrawn from recipient and donor. Bleeding in the latter is controlled by removing the tourniquet and by elevating the arm and by applying pressure for a few minutes over the site of puncture. In the recipient, rotary pressure is applied for a short period over the fontanel at its posterior angle. A bandage is applied and the infant returned to bed or sent home.

Dried Milk Powder in Infant Feeding.

In the *Public Health Reports*, Volume 35, No. 14, April 2, 1920, PRICE states that while gain in weight alone is not sufficient evidence on which to base final conclusions, and while it may prove that excess gain over that which has been considered normal may not be desirable, his figures seem to indicate that the whole milk powder and the skimmed milk powder and unsalted butter employed in his study are useful in infant feeding, and further—and especially in the case of the whole milk powder, and in the case of babies who are undernourished and who digest natural milk badly—these remade milks may have points of distinct advantage. The figures also warrant the conclusion that reconstituted, reconstructed,

and natural milks differ in their effects when fed to infants; and that reconstituted and reconstructed milks should not be substituted and sold for natural milk in a manner to deceive the purchaser.

The opinions expressed by the nurses with respect to the comparative value of reconstituted, reconstructed, and natural milk in infant feeding, and with special reference to the influence of these different milks on the babies' general development, activity, teething, and disposition, strengthen the conclusions that reconstituted and reconstructed milks, of the brand employed, are safe and useful for infant feeding, and particularly in the case of reconstituted milk, and in the case of babies who digest natural milk badly, they may have points of distinct advantage. The opinions of the nurses further strengthen the conclusion that reconstituted, reconstructed, and natural milks differ in their effects when fed to infants.

Treatment of Pruritus Ani.

In the *American Journal of Clinical Medicine* for April, 1921, PENNINGTON states that when there are few or no objective symptoms, he finds that painting the region with a 2- to 5-per cent solution of chrysarobin in traumaticin, once in three to five days, and applying the ointment given in the next paragraph, night and morning during the interim, is one of the best modes of treatment. The application sometimes gives rise to considerable pain for a few moments, especially if there are cracks and abrasions; but this soon subsides. When the surface is dry, after application, he takes a thin layer of cotton, sprinkles it with talcum or some other powder, and places it over the field to prevent staining of the underclothing.

The formula referred to just above is as follows:

Menthol, 3 to 4 grs.;
Phenol, 8 to 12 mins.;
Zinc oxide ointment,
Vaselin or tallow, aa 2 drs.

M. et ft. unguentum. Sig.: Apply locally night and morning after cleansing the part with warm water and drying.

The Application of the Schick Reaction and the Immunization of Susceptibles to Diphtheria with Toxin-antitoxin.

In the *United States Naval Medical Bulletin* for April, 1921, NORWOOD states that the constitutional reaction following the injection of toxin-antitoxin was not serious in any of his 2911 subjects, though in a small number reactions similar to that following the administration of typhoid vaccine occurred. The several cases requiring bed treatment were less than 5 per cent. The total number of reactions, which includes those presenting mild symptoms such as malaise, headache, and a low temperature, but not requiring special treatment, was 8 per cent. Injection of a mixture of toxin-antitoxin in immunes generally causes a severe constitutional reaction. This occurs frequently when injections are given following a wrong interpretation of the pseudo, or false, reaction.

It is believed that a systematic application of the Schick reaction to the personnel of the navy, including all officers and men below the age of fifty, with particular attention to the recruit, and the administration of proper doses of toxin-antitoxin, would practically eliminate diphtheria from the navy.

The following conclusions and recommendations are based on the observations made on a large number of tests performed on children and adults:

(a) The application of the Schick reaction is simple and exceedingly practical.

(b) The subcutaneous or intramuscular injection of a slightly toxic mixture of toxin-antitoxin in 1-mil doses at weekly intervals until three doses are given will establish an active immunity to diphtheria in from two weeks to three months that will last from one to three years, if not permanently.

(c) A person presenting an immune reaction does not require prophylactic treatment if exposed to diphtheria.

(d) Immunes, as indicated by the reaction, who are carriers of the diphtheria bacillus do not develop the disease.

(e) All persons (officers and men) under fifty years of age in the naval service should be subjected to the reaction and the susceptibles immunized with toxin-antitoxin.

(f) The result of the test should be entered in the health record of the individual.

(g) Subsequent tests should be made annually on susceptibles who have been immunized, as well as natural immunes, until at least three negative tests have been recorded and the immunity proved permanent.

(h) Medical officers should be instructed in the technique of the test and the proper interpretation of the several reactions.

(i) Medical officers familiar with the work should direct special attention toward determining, if possible, the degree and the duration of the immunity conferred by toxin-antitoxin, and should make a careful report of such observations for the information of those concerned.

The Absence of Pancreatic Secretions in Sprue and the Employment of Pancreatic Extract in the Treatment of the Disease.

In the *American Journal of the Medical Sciences* for April, 1921, BROWN states that these cases are far too few in number to justify us in drawing definite general conclusions in regard to the pancreatic secretions in sprue, but we do feel that they add something to our knowledge of the secretory disturbances met with in this disease and are worth recording, both from the point of view of pathology and of treatment. The careful study of these cases leads one to certain queries anent this disease: Is sprue one or several diseases? Are the major portion of the symptoms due to the primary lesions, or are many of them much better explained on the basis of secondary starvation? Is it possible to explain the picture on the assumption that it represents an infection due to a monilium, and, if so, is one or several species involved? Or may various organisms or groups of organisms having the

common quality of producing marked acid fermentative changes in the chyme bring about these symptoms? What rôle does diet play? May this possibly be a new member of the ever-increasing group of deficiency diseases? Is sprue very much more widely disseminated in temperate climates than has hitherto been supposed, and may it play some rôle in certain of the vague chronic digestive disturbances so frequently met with in countries which lie in the southern portions of our temperate zones—for example, our Southern States?

Whatever our answer be to these queries, Brown feels that the study of his cases shows that in certain at least of the chronic cases of the disease (1) there is a practically complete absence of the pancreatic ferments, and (2) that while, obviously, all the well-recognized forms of treatment—dietetic, hygienic, etc.—should be rigorously carried out, nevertheless very great improvement and, in some cases, apparently clinical cure can be brought about by regular and constant administration of pancreatin.

Vaccine Therapy the Most Rational and Effective Method of Preventing Whooping-cough in Public Institutions.

In the *New Orleans Medical and Surgical Journal* for April, 1921, BLOOM and DE REYNA state that during the month of April, 1919, five cases of whooping-cough were noted in the St. Vincent's Foundling Orphan Asylum. The cases in question were discovered in different wards, in the second stage of the disease. Practically all of the children had been subjected to infection. Promptly these children were isolated and an attempt was made to limit the further spread of this serious malady.

Appreciating the prophylactic virtue of the pertussis vaccine, they decided to use this method, in the hope of eradicating this disease. In order to state the value of the results obtained, it might not be amiss to give the readers a brief mention relative to this institution. This asylum cares in the main part for the greater number of illegitimate children born in this institution,

city, and in neighboring parishes. A large per cent of those admitted are marasmic; others show different manifestations of malnutrition; and many give signs of congenital lues. The resident population is constantly changing, inasmuch as many of the children are adopted, and the older ones are sent to different institutions for further care and permanent abode. The dietetic consideration is seriously wanting, and even though some children have remained in this institution for a period of three or four years they are more or less under par.

The institution is overcrowded and the buildings are old and antiquated. These facts are given not in the way of disparagement, but simply to demonstrate forcibly that even with serious handicaps in the way of birth and environmental factors the protected children did not contract whooping-cough although they were intimately exposed to this disease.

The Cases.

Under 1 mo. (youngest case, 10 days)	13 cases
1 mo. to 6 mos.	50 "
6 mos. to 1 yr.	34 "
1 yr. to 6 yrs.	107 "
Total	204 "

The vaccine employed in this institution was a mixed stock vaccine (recently prepared within one month). No preservative was used in its manufacture. Each Cc. of this vaccine contained 5,000,000,000 Bordet-Gengou bacilli and 3,500,000,000 influenzæ bacilli.

The Method.—Infants under 6 months, $\frac{1}{4}$ Cc., 3 doses, on alternate days. Infants from 6 months to 1 year, $\frac{1}{2}$ Cc., 3 doses, on alternate days. Children from 2 to 6 years, $1\frac{1}{4}$ Cc., 3 doses, on alternate days.

The Results.—In previous years not less than fifty per cent of the entire number of children living in the institution contracted whooping-cough. From the first week in May, 1919, to the first of January, 1920, there was not a new case of whooping-cough noted in the institution. Bloom and De Reyna believe it is evident that the prophylactic use of this vaccine has untold possibilities in the prevention of whooping-

cough in asylums, schools, and public institutions, and in the limiting of disastrous epidemics.

Induced Pneumothorax in the Treatment of Pulmonary Tuberculosis.

In the *New York Medical Journal* of April 6, 1921, STIVELMAN states that the percentage of cases suitable for pneumothorax had been variously estimated from five to twenty per cent. This extreme variation is due to the fact that the studies were not made from comparable material. Those who treat the very early tuberculous report a greater percentage of suitable cases. On the other hand, those who are in charge of hospitals for the far-advanced tuberculous see but few suitable cases. For a similar reason, reliable statistics on the results of this therapy are not available. Those who treat incipient and strictly unilateral cases are able to show a larger percentage of excellent results than those who apply this treatment in the advanced and hopeless cases.

At a sanatorium with which he is connected an excellent opportunity presented itself to study the value of pneumothorax in all forms and stages of phthisis in which it is indicated. More than half of his cases were observed for a long period of time and were hopelessly progressive. Others were suffering from uncontrollable hemoptysis. In these two groups pneumothorax was induced as a last resort. On the other hand, many of his cases were moderately advanced, and although the better lung was not much involved they ran an active and progressive course, and pneumothorax was induced as a matter of choice.

Of the last sixty-five cases so treated, thirty-eight suffered from far-advanced bilateral lesions, ran an active, progressive course, and their chances for recovery under the ordinary sanatorium care were very poor. Of these, four, or 10.4 per cent, were discharged with disease in arrested condition. Eighteen, or 47 per cent, made remarkable improvement, their constitutional symptoms abated, cough and ex-

pectoration markedly decreased, and many were able to go home and resume their duties as bread-winners. Three of these cases received pneumothorax on account of uncontrollable, severe, recurrent hemoptysis. The remaining sixteen, or 2.6 per cent, did not profit by this treatment. In eight of these the lesion in the other side was activated, three developed pyopneumothorax, in four the preëxisting tuberculous laryngitis assumed dangerous proportions, and one died of meningitis.

In this group there were also three cases in which the induction of pneumothorax could not be effected on account of obliteration of the pleura. Two of these have since died and one is progressive.

Pneumothorax was also induced in twenty-seven moderately advanced cases which ran an active and progressive course, and although in these the better lung was only slightly involved, their prognosis was not at all favorable. Fourteen, or 52 per cent, of these were discharged with disease arrested; the condition of nine, or 33 per cent, improved so markedly that they were able to leave the institution and do at least part of the work they had done before their illness. In four cases, or 15 per cent, the pneumothorax was of no benefit because of the progress of the disease on the untreated side. In this group there were three cases in which pneumothorax was induced on account of severe, uncontrollable hemoptysis.

In this group there were also four cases in which inflation of the pleura was technically impossible. Three of these are progressive and one is holding his own.

Analysis of these figures shows that 28 per cent of all hopeless cases were discharged with disease arrested, 42 per cent with condition markedly improved, and 30 per cent did not profit by this treatment; while in a similar group of patients in whom pneumothorax could not be induced on account of technical difficulties, 85 per cent have either died or are progressing rapidly to a fatal termination.

In view of the results obtainable with artificial pneumothorax in a class of patients

whose prognosis is hopeless otherwise, it is obvious that this method of treatment represents the most remarkable advance in the treatment of tuberculosis in modern times. No excuses are to be offered for its induction in suitable cases. On the contrary, many should be asked to explain why they do not resort to this treatment when all other measures fail. There are many who attempt to discredit this method of treatment, although they have had absolutely no experience with it. Others presumably on account of their inability to choose the proper case and to judiciously maintain a satisfactory pneumothorax openly oppose it.

The Problem of Gastropptosis.

In the *Ohio State Medical Journal* for April, 1921, the editor makes the following note in reference to an article on this subject by Dr. Willard C. Stoner:

It is difficult if not impossible to really determine in what measure faulty anatomy, posture, and inherited nervous weakness contribute to the incidence of gastropptosis. Clinical observation, however, proves that loss in weight, impaired muscle tone, whether from disease or poor nutrition, heavy lifting, overwork, improper dress, changes in the female pelvis incident to puberty and repeated pregnancies are definite factors in establishing the condition. It is interesting to note that gastropptosis may exist without symptoms and without any change in the secretory or motor function of the stomach; that the symptoms do not necessarily conform to the degree of ptosis. We have no means of knowing, as yet, the sequence in these cases; whether ptosis produces symptoms or whether the condition incident to the symptoms results in ptosis. The important factor in the vicious circle of this condition is an inherent unstable nervous state. Absolute rest with forced feeding to promote nervous stability and increase weight, and massage to enhance muscle tone, are important simple phases in the successful management of gastropptosis.

Treatment of Vomiting in Pregnancy by Adrenalin.

The Practitioner for April, 1921, in its columns on "Practical Notes" states that Ruthery and Bordet report excellent results obtained in the treatment by adrenalin of persistent vomiting in pregnancy. They give the drug by hypodermic injection, 1 mg. of adrenalin hydrochloride in 250 Cc. of normal saline, by ingestion of 1 mg., or by enema containing 1 mg. The daily amount given does not exceed 2 mg., and the total amount given has been from 4 to 8 mg. in the course of from four to seven days.

The vomiting ceases almost immediately, the general condition improves quickly, diuresis increases by degrees, and the arterial tension is in no way altered.

A Protest Against Radicalism in Surgery of the Nose, Throat and Mouth.

In the *Journal of the Medical Society of New Jersey* for April, 1921, KNOX states that it seems to be difficult or impossible for us in the first flush of surgical achievement to keep within the bounds of healthy conservatism. First one type of surgery and then another has suffered because of the grandiose self-assurance of enthusiasts.

When he began the study of medicine eighteen years ago surgery of the lower abdomen and pelvis was the *pièce de résistance*; every ileocecal colic called for an appendectomy, and every retroverted uterus required fixation. We have now a long line of postoperative neurasthenics that had better have been left alone.

This misguided effort has now subsided to some degree, and the nasopharynx and mouth have become the channels through which the modern young man finds sublimation and outlet for his *libido*.

He is utterly opposed to the indiscriminate removal of teeth, tonsils, and nasal bones. The last word has not been said in the case of focal infections; far from it. He believes that in the expectancy of certain cardiac, articular and choreiform

conditions ectomy of tonsils and adenoids should be considered, and he also believes that in practically every other condition the organisms causing the symptoms should be identified and found to be the same as those infecting the focus which it has been proposed to remove; especially should this be done when the focus is accessible. He knows from a considerable experience that the effect of tooth extraction in the neuroses has been much overrated, and the results on general health of the use of artificial teeth are in many cases worse than the pus could ever have been.

Adrenalin Hypersensitiveness and its Relation to Hyperthyroidism.

In the *American Journal of the Medical Sciences* for April, 1921, PEABODY, STURGIS, TOMPKINS and WEARN state that the general conclusions which it seems justifiable to draw from their observations are as follows:

1. Different individuals, both sick and well, react with different degrees of intensity to the injection of adrenalin. By means of selected dosage of the drug and carefully chosen criteria for the response, one can differentiate, somewhat artificially, between the slight reactions which are called "negative" and the more violent reactions which are called "positive." In certain instances "doubtful" or "questionable" reactions are obtained.

2. The fundamental nature of the reaction is unknown. It is associated with a rise in heat production which runs more or less parallel to the intensity of the reaction. On the basis of what is definitely understood with regard to the physiologic action of adrenalin it seems probable that the phenomenon is due to a stimulation of the sympathetic nervous system. Theoretically a "positive" reaction might indicate hyperactivity of the thyroid gland, of the adrenal glands, or of the sympathetic nervous system. It might, on the other hand, depend on a lowered threshold of response of the sympathetic nervous system. With the exception of hyperthyroidism little is

known about these conditions in man, but they probably occur, and there would seem to be no reason for assuming that a "positive" adrenalin reaction is constantly associated with hyperthyroidism. It is much more likely that different causes account for the reaction in different types of clinical cases.

3. Hypersensitiveness to adrenalin is found in many patients with the clinical picture of hyperthyroidism and with an increased basal metabolism, but it is not constant under these conditions.

4. Hypersensitiveness to adrenalin is also found in persons who have no indications of hyperthyroidism. Thus it was present in many psychoneurotics, in about 50 per cent of patients convalescent from acute infections, in nearly the same proportion of soldiers with "effort syndrome," in 14 per cent of apparently normal young men, and in patients with various unrelated diseases.

5. The "positive" reaction to adrenalin appears to occur most often in highly nervous individuals, but it is not constant in such persons. The clinical significance of the reaction is not clear, but at present it should certainly not be regarded as having any specific significance in the diagnosis of hyperthyroidism.

Influenza.

In the *American Journal of the Medical Sciences* for April, 1921, FROTHINGHAM states that considerable interest has been aroused in regard to the possibility of vaccination as a prophylactic measure against this pandemic disease, and as a prophylactic measure against the development of pneumonia as a complication of the disease. On the assumption that the disease was caused by the influenza bacillus, and as the pneumococcus and streptococcus were frequent secondary invading organisms in the lungs, vaccines were prepared by combining cultures of influenza bacillus with the various types of pneumococci and streptococci. Individual reports have been made by Rosenow and Sturdivant and others

favorable to the use of these vaccines, not only in preventing the disease but also in diminishing the amount of pneumonia and the fatalities from it. Most of the work with vaccines has been carried out in regions in which the disease was already present, and therefore it was impossible to carefully control the experiments.

McCoy and his coworkers succeeded in studying the value of a protective vaccine under careful control, and found that not only it did not prevent the disease but also it did not influence the incidence of pneumonia or the mortality from it. McCoy perhaps sums up the situation most clearly in his statement that figures from uncontrolled experiments seem to suggest that the vaccine is of value, but carefully controlled experiments show that it is of no use. On the assumption that this disease was spread by the dissemination of the virus by means of droplets from the respiratory tract, elaborate measures to prevent the spread of the virus by the wearing of masks, etc., have been suggested and tried out not only among the ill and their attendants, but among the entire population of a community. The value of such procedure in the absence of carefully controlled experiments is quite uncertain, and the sense of protection given to the public, if erroneous, may be harmful. Some doubt exists as to the value of such procedures with our present knowledge.

Complications of the Arsphenamine Treatment of Syphilis.

The *Journal of Laboratory and Clinical Medicine* for March, 1921, in an editorial on this subject, states that the matter of toxic reactions that appear during or after treatment—especially the intravenous—with arsenic preparations is discussed by Parnell and Fildes upon the basis of their experience with the intensive treatment with neosalvarsan (neokharsivan and novarsenobillon). Most of the cases were suffering from early syphilis, and all were, except for their infections, healthy. There were 1250 patients treated, and each received a

course of six doses of 0.45 grm. given intravenously at two-day intervals. Parnell and Fildes separate the toxic reactions which they believe are due to the drug itself from the so-called endotoxic reactions, which they say are invariable to a greater or less extent after the first and occasionally after the second injection in cases of early untreated syphilis. These reactions consist of pyrexia, which usually starts six hours after the injection, and may be accompanied by a chill or headache and nausea. The cause of this is, they say, to be found in the "syphilis toxin" which is suddenly liberated from the treponemas by the destructive action of the drug. They also exclude what they call "water fever," which is due to impure water, and which consists in a fever starting very shortly after the injection.

The symptoms upon which the authors place emphasis are pyrexia, skin lesions, headache, suffusion of the eyes, vomiting, edema, pain, herpes, rigors, delirium, coryza, nausea, jaundice, albuminuria, dryness of throat, air hunger, salivation, cyanosis, biliuria, and a number of other minor ailments. Pyrexia, skin lesions, headache and suffused eyes vary in incidence. The skin lesions were mostly erythematous or macular in type. Symptoms of any type occurred in but 55 of the series of cases, and for the most part they were exceedingly mild. Considering the potency of the drug and the number of patients in whom it was used, the number of complications is almost negligible.

In connection with this matter of ill effects of salvarsan it is of interest that in the Report of the Medical Research Committee the causes are assigned to (1) toxicity of the drug; (2) errors in technique; (3) susceptibility of the patient; (4) causes unknown. Given a standard preparation of the drug, and a good technique, including testing of the ampoules by immersion in alcohol before using them, the main cause is a personal susceptibility of the patient. If the drug is administered by the gravity method, then an essential part of the technique includes careful preparation of the rubber tubing.

The committee gives hemophilia, Graves's disease, Addison's disease, lymphatism, syphilis of the central nervous system, cardiac disease (especially myocardial), aneurism and arteriosclerosis, severe pulmonary disease, hepatic disease, gastric and intestinal catarrh, renal disease, alcoholism, acute septic conditions and constitutional tendency to skin diseases, as calling for caution in the use of arsphenamine. As danger-signals during treatment they give loss of weight, headache, insomnia, loss of appetite, appearance of renal symptoms, stomatitis, diarrhea, jaundice, and erythema. Still more information, statistically speaking, is obtained from the committee of German physicians, whose report is reviewed by Meirowsky. This report deals with 13,000 injections with old salvarsan, 40,954 of sodium salvarsan, 171,826 of neosalvarsan, and 64,500 of silver salvarsan. Out of the total injections of old sodium and neosalvarsan there were 12 deaths attributed to the drug (1 in 18,815); but as some of the fatalities might have been avoided by more careful precautions the chance of death is put at 1 in 56,445 (1 in 13,000 with old salvarsan, 1 in 20,000 with sodium salvarsan, and 1 in 162,800 with neosalvarsan). When the dose of neosalvarsan exceeded 0.6 the deaths rose to 1 in 3000, hence the committee recommend that 0.6 be the maximum dose. Encephalitis and dermatitis are more liable to occur after an overdose.

The Intravenous Use of Corpus Luteum Extract in Nausea of Pregnancy.

HIRST in the *Journal of the American Medical Association* of March 19, 1921, states that preparations of corpus luteum available are: (1) a compressed tablet, containing about 5 grains of the dried substance; (2) powdered extract; and (3) ampoules for hypodermic administration, containing 0.2 gm. of the dried substance in solution in 1 Cc. of physiologic sodium chloride solution.

Corpus luteum may be administered (1)

by the mouth; (2) by subcutaneous injection; (3) by deep intramuscular injection; or (4) by intravenous injection.

Administration by mouth, using either the tablets or the powder, leaves much to be desired. The substance is affected by oxidation on exposure to the air; it is radically changed by the process of digestion, and often causes considerable nausea and other gastric disturbance. The good results obtained are far less striking than by hypodermic injection.

Subcutaneous injection is mentioned only to be condemned. Any animal extract given superficially under the skin causes considerable pain, local reaction, and often local suppuration.

Deep intramuscular injection is much more desirable. The choice of location is the deltoid muscle, and the injection is given deeply into the muscle. The needle should be perpendicular to the skin surface, and not inclined at an angle, as is usual in ordinary injections. Whatever site is chosen, the needle must be long enough to penetrate through the superficial fat, into the muscle. This method has given about 80 per cent of successful results, but has the slight objection that there is often some muscular stiffness and slight local reaction, but nothing of any moment. In several thousand injections he has not yet seen a case of suppuration.

Intravenous injection should be and he believes is the ideal method of administration. At first there was some doubt as to the sterility of the solution in ampoules, but very extensive experience with the intramuscular injection, without a single case of suppuration, finally gave him confidence enough to warrant the trial of intravenous injection. For the last two years his assistants and he have used no other method. Their experience includes ambulatory dispensary and office patients, and bedridden patients in the hospital and in private homes.

Reasons for intravenous injections are as follows: The material used is carried directly into the circulation, giving the most

rapid absorption possible. It is possible and advisable to use a considerably larger dose (two or three ampoules) than is possible with the intramuscular injection, in which more than 1 Cc. causes considerable local reaction. Each ampoule contains only 0.2 gm. of the extract, and in this way the necessary total quantity can be introduced more easily and quickly. There is no local reaction or discomfort of any kind after the injection. Intravenous administration often controls the vomiting promptly, in cases in which intramuscular use has failed.

The method of administration does not differ materially from the ordinary intravenous injection:

A glass hypodermic syringe of 3 Cc. capacity is prepared by boiling, and cooled. Alcohol is not desirable as an antiseptic for the syringe or needle.

The ampoules to be used are washed and rubbed thoroughly with an alcohol pad.

The ampoules are filed at the neck and broken in sterile gauze, and the contents drawn into the syringe.

A tourniquet is placed on the patient's arm, above the elbow.

When the veins become prominent, at the bend of the elbow, a suitable one is chosen and the skin over it is painted with 7-per cent tincture of iodine.

The needle, attached to the filled syringe, is passed through the skin into the vein.

As a test, the plunger of the syringe is pulled slightly back, and if the needle is in the vein, blood will appear in the syringe.

The tourniquet is loosened, and the contents of the syringe slowly injected, taking about fifteen seconds to each cubic centimeter.

When the syringe is empty, the needle is withdrawn. The small puncture requires no dressing.

The same vein can be used repeatedly.

In stout women it is often difficult to locate any vein at the elbow. In such cases the veins in the back of the hand are usually the most accessible.

The dosage varies, depending on the type of case under treatment. Ambulatory

patients who can come to the office or dispensary usually receive 2 Cc. every other day. In more severe cases, when office visits would be a hardship, the patients receive 2 Cc. daily, given at home. In pernicious cases 2 Cc. is given twice daily, and the patients are of course confined to bed. Experience has shown that patients should receive at least 12 Cc. entirely irrespective of the fact that they respond quickly and favorably to a smaller number. If fewer are used relapses are common, and are more difficult of control than the original attack.

Anaphylactic reactions need not be feared. In many hundred injections, all intravenous, in the hands of his assistants and himself, there was one single case in which a reaction occurred, and that case was somewhat questionable.

The patient was a very neurotic dispensary patient. Shortly after the injection she began to vomit excessively; a similar attack, however, had occurred also before any injection had been given. As a precautionary measure she was kept in the hospital over night, but no further untoward symptoms were observed. It is, of course, possible that an occasional protein-sensitive individual might show a measure of reaction after injections; but this would occur with any serum, and the possibility is negligible.

One word of caution is needed. The presence of a goitre in early pregnancy absolutely contraindicates the administration of corpus luteum extract, either intravenously or intramuscularly, for the control of nausea. In their experience every such patient has been made much worse by this treatment.

In not a single case has there been any rise of temperature or any evidence of infection following the intravenous use of the extract. They have learned to have confidence in its sterility and now employ it in no other way. The results are more gratifying, more prompt and more lasting than by any other method, and he is confident that the extended experience of the profession will bear out these statements.

Since this article was written there has

been one other case of moderate reaction, evidencing slight shock and vaginal bleeding. This patient aborted within twenty-four hours, and is the only one in the records in whom abortion seemed to have resulted from the injection.

Recognizing and Treating Neurosyphilis in the Early Period of the Infection.

In the *American Journal of the Medical Sciences* for March, 1921, FORDYCE states that a definite and constructive plan for the prophylaxis of the degenerative stage of syphilis of the central nervous system and its treatment in the initial stages can only be devised by a study of the infection in its inception. His clinical and serological work during the past ten years has enabled him to formulate the following propositions:

1. Syphilis of the nervous system probably begins in the first year of the infection. The number of cases corresponds roughly with the total number of cases of so-called late neurosyphilis. The foregoing statements are based on the following observations and established facts: (a) The number of early cases showing positive findings in the spinal fluid; (b) familial types of neurosyphilis; (c) biologic evidence of a neurotrophic strain of the treponema; (d) persistence of the infection *in loco*, as in aortitis, interstitial keratitis, etc.; (e) observation of patients who developed signs of early syphilis of the nervous system and who after many years died of paresis or other late degenerations; (f) no serologic evidence as yet exists showing normal spinal fluid in the early stage and its infection at a later period.

2. Early neurosyphilis may manifest itself by obtrusive symptoms, by slight objective signs, or be asymptomatic. Treatment by the usual channels may control the obtrusive symptoms. It seldom cures the underlying infection. Symptoms at times develop during or shortly after intensive courses of arsphenamine and mercury. If not cured these early infections may persist and cause late neurosyphilis.

3. Acceptance of the foregoing propositions leads to the logical deduction that no case of syphilis should be discharged without the knowledge gained by examination of the spinal fluid. In case no evidence of infection is found a prognosis of probable future immunity may be made. If infection exists it should be treated by methods shown by experience to be effective.

4. Fordyce is convinced by an experience of seven years in the use of intraspinal therapy that practically all cases of early neurosyphilis can be cured more rapidly, and in the majority of cases only cured, by the combined intravenous and intraspinal method.

Cataclysmal Hemorrhage After Tonsillectomy.

The *British Medical Journal* of March 12, 1921, in an editorial on this subject, states that bleeding of great severity is fortunately rare after tonsillectomy, and overwhelming hemorrhage leading to the almost instant death of the patient is amongst the rarities of medicine. A brisk arterial spurting from the tonsil-bed is not very uncommon, particularly in those adults who have a sclerotic, buried tonsil. In such cases the vessel involved is commonly believed to be the ascending pharyngeal, or more rarely one of the other arteries which supply the tonsil, but abnormally placed or abnormally large.

There are, however, in the archives of medicine records of cases in which the hemorrhage was so appalling that one or other of the carotid vessels was believed to have been injured, no other regional vessel being thought capable of such violent bleeding. Fear of a disaster of this nature was well known to our fathers, and forms the background to a story told of Nélaton. A friend met Nélaton at some distance from Paris, and asked him what brought him thither. "I have just done the operation," he replied, "which takes most of me. I have removed two tonsils." With this anecdote M. Sebileau closes an exceedingly interesting description of an overwhelming

and immediately fatal hemorrhage following tonsillectomy. M. Sebileau was not himself the operator. It was his duty to perform a necropsy on the child in question with a view to the absolution or arraignment of the surgeon. All who prize good writing, and particularly dramatic writing, may be recommended to read M. Sebileau's account of the operation and its sequels.

The possibility of wounding either of the carotids has been doubted by many, and M. Sebileau went to considerable pains to establish beyond doubt the source of the hemorrhage in this case. He injected the two carotids and the internal jugular severally with three different colored media, and was able to show beyond all question that a piece had been cut out of the wall of the internal carotid artery. Precisely how this happened, how the surgeon went blindly after the upper pole of the tonsil which had escaped removal, and how, hampered by the child's struggles, he cut away the posterior faucial pillar instead, is vividly described. The paper is well documented and contains a useful description of the relationships of the various vessels to the tonsillar fossa. M. Sebileau searched the literature of the subject and has found some eight or more recorded examples. It is not certain that in all of these the carotid was the vessel injured, but the violence of the hemorrhage makes this probable. M. Sebileau has collected also six cases of injury to the carotid inflicted whilst incising a tonsillar abscess. These accidents, when they do occur, are amongst the most painful disasters that can befall a surgeon.

Pneumonia Following Influenza in the Camps in the United States.

In *The Military Surgeon* for March, 1921, IRONS states that in the endeavor to do all possible to save lives many methods of treatment were tried both for prophylaxis and the cure of pneumonia. In general it seems evident that there has been no distinct advance in special methods of therapy, and that so far the most effective treatment is that afforded by rest in bed,

good nursing care, a light, easily digested diet, careful observations to detect complications, the treatment of special symptoms such as cardiac weakness by digitalis, as they arise, the avoidance of unnecessary moving of the patient, and continued care with daily watchful supervision and graduated exercise during convalescence.

There seems to have been no value in prophylactic injections of vaccines in the prevention of influenza, nor should we expect there to be, in view of the fact that we do not know the causal organism. Assuming that prophylactic injections of pneumococcus vaccine are effectual in preventing pneumococcus lobar pneumonia, no specific effect from a vaccine could be anticipated, in preventing pneumonia following influenza due to the streptococcus or staphylococcus.

The most important single factor in preventing pneumonia following influenza was early hospitalization, with rest in bed in warm, well ventilated wards, and with precautions to prevent infection of one patient with organisms from other patients who might harbor more virulent strains. The value of immediate rest in bed at the onset of influenza was shown in a multitude of instances. Of two large groups of nurses, one group of whom tried to remain on duty while suffering from influenza, while the other group went to bed at the first symptoms of illness, the incidence of pneumonia was almost twice as great in the first as in the second. Many of the severe pneumonias admitted to the wards from line organizations were in soldiers who had sat around in quarters during their first attacks of influenza and came to the hospital only on the appearance of the more severe illness.

Care of the bowels providing for daily evacuation was important. The establishment of any routine treatment to be given all pneumonias seemed to be productive of as much harm as good. Under such a rule, whether digitalis, salicylates, opiates, atropine, or other drug is so ordered, a number of patients will receive an excess and suffer the consequences of overdrugging. Individualization and common sense were never

at a greater premium than in the army camps during the epidemic.

Various forms of intravenous therapy by injecting proteins, vaccines, peptone solutions, solutions of liquor formaldehydi and of glucose were employed, but a review of reports of results obtained does not convince one of their efficacy. It may be noted that their use is not free from danger.

Convalescent serum was used to some extent, with results believed to be favorable by some of those using it. Most of the reports however lack adequate controls, or when controls are given it is not clear that controls and treated cases were distributed equally in the same period of the epidemic.

The Internal Secretion of Sandstroem's Glands, Parathyroid Hypofunction, and Eclampsia.

In the *American Journal of Physiology* for March, 1921, in the Proceedings of the American Physiological Society, MASSAGLIA states that dogs and cats operated upon for removal of two or three parathyroids, if they live in normal conditions, have no nervous symptoms. This special state is called "latent parathyroid insufficiency." When there is in the circulation an increase of the toxic substances which the parathyroids neutralize, the single parathyroid, or the two parathyroids which remain, become unable completely to perform their function, and we have an autointoxication ending in tetanic symptoms. Therefore with an increase of determined poisons in animals in a state of latent parathyroid insufficiency, a resulting tetany will show that kind of poisons are neutralized by the parathyroids. The waste products were increased in the circulation by means of: (a) pregnancy; (b) an impairment of the function of the kidneys by means of progressive stenosis of the ureters and of the renal veins; (c) a derangement of the liver caused by a progressive stenosis of the ductus choledochus or of the portal vein, or (d) from phosphorus poisoning; (e) muscular fatigue induced by forcing dogs to run for

a long time in a treadmill; (f) lead poisoning.

The study brought out the following facts: (1) The parathyroids neutralize the poisons from pregnancy, from muscular fatigue, and from the intestine; they do not neutralize phosphorus or lead poisoning. (2) Parathyroid hypofunction—especially in pregnancy—produces an autointoxication which injures the kidneys and the liver. However, neither a renal nor a hepatic hypofunction will directly produce a parathyroid hypofunction. (3) Parathyroid hypofunction in pregnancy produces a tetanic syndrome exactly similar to eclampsia; therefore parathyroid hypofunction can be one of the causes of eclampsia. This does not preclude the possibility of other etiological factors. This conception is supported not only by experiment, but also by the findings in several autopsies on eclamptic women which showed a lack of the normal number of Sandstroem's glands or severe lesions in the parathyroids.

In eclampsia caused by parathyroid hypofunction, prompt treatment with parathyroidin gives good results.

The Simple Detection and Qualitative Tests for Morphia, Its Compounds, and Derivatives.

In the *China Medical Journal* for March, 1921, READ states that he has analyzed many samples submitted for examination during the last twelve years, and circumstance has forced the development of simple methods. The following procedure should be of service to many, whose work is limited to the use of simple hospital drugs:

Take the powder or the pulverized material and add several times its volume of dilute sulphuric acid. Let stand over night, then filter. Add one volume of hot chloroform, and after the chloroform enough strong ammonia to make the solution alkaline; test with litmus paper. Mix, and after allowing the chloroform to separate, remove it with a pipette or by any other suitable means. Allow the chloroform to evaporate to dryness in an evaporating dish

or a watch-glass, and test the residue with a drop or two of Kobert's solution—*i.e.*, strong sulphuric acid containing about five per cent of formalin, made by mixing two or three drops of formalin with three or four mls of strong sulphuric acid. An extract from an opium or morphia preparation will always give a vivid purple-violet color. Another spot on the dish may be tested with strong nitric acid, which gives with morphia an orange color quickly fading to yellow.

If the sample tested be a white powder or of very small bulk, the above tests with formalin-sulphuric acid and nitric acid may be made directly—*i.e.*, without mixing with acid and subsequently extracting chloroform and ammonia. A few grains of powder under the microscope surround themselves with purplish-red or violet zones when treated with formalin-sulphuric acid.

From time to time one sees the problem of the detection of opium or morphia approached from various angles, such as the toxicological detection of morphine in the various body organs. Practically all of these tests are included in a general statement of the reaction of morphia with various test solutions and reagents. The other compounds of morphia very occasionally met with, such as heroin (diacetyl morphine), peronin (benzyl morphine), dionin (monoethyl morphine hydrochloride), etc., respond to a number of these tests as indicated. These are given here for use of the more expert worker, in the order found to be most useful:

1. Kobert's test, as mentioned above. Dionin, heroin, codeine and most morphia compounds give a similar reaction.

2. Morphine gives with strong nitric acid an orange color, changing to yellow. Codeine and heroin give only a light yellow color.

3. Morphine, or its compounds, is precipitated by all the usual alkaloidal reagents, *e.g.*, picric acid, potassiomeric iodide, iodopotassium iodide, etc.

4. Morphine gives a blue color to a paste of ammonium molybdate in strong sulphuric acid. Sensitive to one hundredth of a milligramme. Titanic acid and tungstates give similar reactions.

5. Morphine and its salts give a blue color with ferric chloride solution, which is assisted by the presence of acetic acid. Heroin, codeine, and dionin give this reaction after heating with sulphuric acid.

6. A trace of morphine added to 5 mls of very dilute potassium ferri-cyanide to which, has been added a trace of ferric chloride produces a deep blue color. Peronin, codeine, and dionin do not give this color. Heroin gives this reaction after heating with sulphuric acid.

7. Morphine liberates iodine from iodic acid, giving a blue with starch paste. Peronin, heroin, codeine, and dionin fail to liberate iodine.

9. Lloyd's test. A mixture of morphine and hydrastin mixed with a few drops of sulphuric acid develops after about five minutes a blue-violet color. This is specific.

10. A five-per-cent solution of sodium phosphomolybdate produces with morphine solutions a yellow precipitate soluble in ammonia.

Explosion of Ether Vapor During Laryngoscopy.

MCCARDIE in the *British Medical Journal* of April 9, 1921, cites the case of a man of fifty-six who was given open ether to induce anesthesia for laryngoscopy and removal of a piece of the vocal cord. For some minutes before the laryngoscope was introduced ether with oxygen was given through a nasal catheter in addition to ether from the mask. The mouth being opened, ether and oxygen still passing in through the nose, an associate began to introduce Hill's electric laryngoscope. It had not entered more than an inch when there occurred two or three loud reports like small pistol shots, and flames issued from the patient's mouth. These were five or six inches high, and like those seen if a bottle of ether were set on fire. The nasal tube was at once pulled out and the flames quickly died. Anesthesia was continued with chloroform and oxygen without trouble. There was no obvious burning—merely reddening of the

mouth and pharynx—and the patient recovered normally and had no after-cough.

At the time of the explosion the room (temperature 65° F.) was lit by two ½-watt bulbs and one Osram bulb under a shade 2½ feet away almost directly over the patient's head. The bulb of the laryngoscope light did not fuse, and the light appeared in order and there was no evidence of short-circuiting.

Commenting on this case, McCardie said that no heat could be felt by the hand when the light was first switched on. The warm room, warm mouth, warm electric light, warm ether and oxygen, would all help toward the explosion. Ether vapor would take fire at a considerable distance from the source of heat. Squibb had seen ether take fire at a measured distance of 15 feet between the source of escaping vapor and the source of fire. Considering the absolute coincidence of the explosion with the introduction of the lamp, the cause must be found in the electric bulb of the laryngoscope. McCardie related the only other recorded case of ignition of ether vapor in the presence of a closed electric light, and other observers brought forward instances of ether vapor ignition under various circumstances.

Adrenalin in Resuscitation.

The *British Medical Journal* of April 9, 1921, in its "Correspondence" columns publishes the following letter on this topic from Marjoribanks of Aden:

The valuable letter of Lockhart-Mummery in the *Journal* on January 15 may appeal to more of us than he seems to think.

Surely he makes too much of his dilution of adrenalin to 1 in 50,000 before administration. Experimental physiologists have long recognized with regard to intravenous administration that dilution of drugs with the blood can be secured to any extent by slowness of injection. That Lockhart-Mummery found by his observations that 1 in 50,000 was the optimum dilution of adrenalin means no more than that it was

the optimum at the rate at which he injected; no two operators would inject at the same rate and so secure the same dilution in the general circulation, however constant the contents of their syringes were.

The "person skilled in the use of adrenalin transfusion," the necessity for whose presence Lockhart-Mummery considers such a grave limitation of the scope of the procedure he advocates, need be no other than any one of us who is accustomed to using a 10- or 20-Cc. syringe for intravenous medication.

It is this recognition that the blood is the best diluent that has changed the intravenous administration of quinine—for example, from being a procedure for those "skilled in transfusion" to being a matter of an intravenous injection easily within the competence of any tropical practitioner. Provided he takes the precaution of adding 5 minims of liquor adrenalin to his solution, and of injecting slowly, he can avoid the one danger of intravenous injection of quinine—that of a drop in the blood-pressure. The tetanus spore, the bogey of the intramuscular method, he may leave to be dealt with by the leucocytes; and his patients never remind him of his intravenous injections of quinine as they did of his intramuscular ones, followed so often by painful lumps dotted about just the parts of the body they want to lie on.

Intravenous medication is still in its infancy. Used with discretion it has a great future before it; and it is a distinct encouragement to its use, when indicated, that it is the one way of giving medicine which demands no accuracy of dilution in dispensing. The practitioner has only to judge, say, how many grains of quinine or urotropin or how many minims of tincture of iodine he wishes to administer; he gives this in the nearest available syringe, without regard to whether it be a 5- or a 10-Cc. one, and in injecting he presses the piston very slowly, thus further diluting his drug with the most abundant, handy, cheap, and surely sterile saline solution he could use.

If Lockhart-Mummery, out of his experience, will tell us what is the dose of

liquor adrenalin to use in order to have the best chance of restarting a human heart that has stopped beating, we can do the rest.

The Diuretic Action of Pituitrin.

In the *American Journal of Physiology* for March, 1921, in the Proceedings of the American Physiological Society, STOLAND and KORB state that the earlier work on the action of the extract from the posterior lobe of the pituitary body lists it as diuretic, while more recent investigators report both diuretic and antidiuretic actions. This difference in opinion seems to be due mainly to the various methods employed.

It was their purpose in their investigation to devise a method which would permit of the collection of urine under conditions that were as near normal as possible; and to note whether either subcutaneous or intravenous injection of pituitary extract would cause any quantitative variation as to either the volume or the nitrogenous content of the urine excreted.

In these experiments a bladder fistula was established in large, healthy, female dogs. In the course of a few weeks the fistula would heal until the opening was about the size of a lead-pencil. The dog was then given a standard diet, placed in a sling, and a special catheter introduced into the fistula. The urine was then drained from the bladder as rapidly as it was secreted into clean flasks, which were packed in ice. Observations were started at 7 A.M. and ended at 7 P.M. Every four hours the flasks were emptied, volume taken, and quantitative determinations of the total nitrogen, urea and ammonia were made. Determinations of the total nitrogen and urea in the blood were also made for the same periods.

Data were obtained on five days previous to treatment with pituitrin. The animals were then treated with 1 Cc. subcutaneous or intravenous injection of pituitrin for five days, and results on urine volume and nitrogenous content compared with control experiments. Following this observations

were again made without the pituitrin injections.

In every case they obtained during the first four-hour period after the injection of pituitrin an increase of 30 per cent in volume total nitrogen, urea, and ammonia, in the second period a 50-per-cent increase, and in the third a 20-per-cent increase. On the day following the injection of pituitrin the volume was about normal, but the total nitrogen, urea and ammonia content was 20 per cent below normal the first four-hour period, 10 per cent the second, and 5 per cent the third period. During the three four-hour periods following the injection the total nitrogen and urea content of the blood were lowered about 40 per cent.

The above results seem to show conclusively that pituitrin acts as a stimulant to the kidney in that it produces such a marked secretion of urine that the nitrogenous content of the blood falls far below normal.

The Protection of the Public Against Syphilis.

In the *International Journal of Public Health* (Geneva) for March-April, 1921, VERNES states that of all social diseases syphilis is the most deadly and the most insidious, since it strikes not only the living but the unborn. Its toxin permeates to the very germ of life, changing and destroying it. No more dangerous poison exists. Syphilis empties the cradle and fills the hearse without any one being aware of its presence. Ubiquitous, it is yet invisible, and therein lies the source of its very formidable strength. It is possible to be unaware of syphilis at the time when it is transmissible, and then to be fatally injured in heart or in brain without suspecting the cause. Everywhere in process of extension, syphilis represents in society what the silent uprising of a submarine peak on a great sea route would represent to the navigator. For the future of the race it is a terrible danger, often unrecognized, even by those most actively interested in social hygiene. A philanthropist who has consecrated his energies with regal generosity

to the subject of repopulation was able recently to declare that the fight against syphilis had no place in his programme. It must, however, be recognized that, in nearly all civilized countries, the cry of alarm has been raised and steps have been taken to stem the plague. One could only prophesy success for these attempts if they were organized according to a uniform plan adapted to the end in sight, but on the contrary they follow very different lines of action, and this very diversity betrays the general uncertainty in the combat against syphilis, an uncertainty which, in default of a directing idea, results in a great variety of campaigns each following the prevalent customs and opinions.

In Great Britain, a country of individual freedom, patients obtain treatment where and how they will without any official direction; whilst in Germany, country of disciplined organization, consultation posts, spread all over the land, constitute a veritable network of venereal surveillance and pass on their patients either to private consulting rooms or to public institutions, all at the expense of insurance societies which are interested in seeing that their clients with venereal disease shall be watched and treated as soon as their condition demands it. In Switzerland every town arranges its antivenereal organization as it thinks best, basing its action on the federal law concerning epidemic and contagious diseases. Scandinavia strives uniformly to dry up the springs of evil by applying to the germ of syphilis the same general rules that are applied to any virus of contagion—i.e., the rules of discovery and disinfection. This legislation, while apparently logical, offers evident serious inconveniences—violation of professional secrecy, intrusion into private life, denunciations—only to end with a fatally incomplete result. In the United States the same principles of staying and preventing the diffusion of infection are pushed much further to the point of arresting those suspected of infection, to the quarantining of infected persons, and even to the inclusion of illicit sexual relations amongst the punishable offences.

In short, the conflict with syphilis takes different shape among different people. It is obliged to draw its support from anywhere but from syphilography, since syphilography is powerless to furnish it. It cannot become truly effective without attacking the highest of institutions: justice, professional secrecy, and individual freedom.

Studies of Histologic Changes in Organs Induced by Arsphenamine, by Nearsphenamine, and by Mercury.

In the *Archives of Dermatology and Syphilology* for April, 1921, SCHAMBERG states that both the arsphenamines and mercury administered in therapeutic doses bring about some structural alterations in organs. These are doubtless ordinarily repaired like the changes that take place in various acute infectious diseases. The chief organs affected by the arsphenamines are the liver, the suprarenals, and the blood-vessels. The effects of mercury, on the other hand, are seen dominantly in the kidneys and in the brain. The pathologic findings and clinical experience would persuade one to utter two cautions: In mercurial treatment watch the kidneys; in arsphenamine treatment watch the liver. To be sure, as stated by Milian, in early syphilis jaundice may indicate either hepatic syphilis or a Herxheimer reaction, and will respond to more vigorous treatment when the less intense treatment has failed. Later in the disease, however, and particularly after the vigorous use of the arsenicals, the development of jaundice should lead to a suspension of all specific treatment.

The treatment of syphilis requires the repeated use of these drugs. When used with circumspection and good judgment harmful results may in large part be avoided. When used unskilfully, without proper examination of the patient and without knowledge of warning signals, unfortunate results may take place. The fact should be emphasized that the body tolerates much larger amounts of arsphenamine

than mercury. One may, for instance, administer intravenously to a white rat fifty times as much arsphenamine as mercury. More mercury cannot be administered because it has too great an affinity for body cells. The therapeutic dose of arsphenamine is infinitely more destructive to the spirochete of syphilis than the therapeutic dose of mercury. The spirochetes in a chancre can be destroyed in a few hours by an injection of arsphenamine; this accomplishment is impossible with a single injection of mercury. Fatalities have occurred both after arsphenamine and mercury. Those after the former are much more tragic and fear-inspiring, for the relation between cause and effect is obvious. Many scores, if not hundreds, of deaths after mercury have likewise been reported in the literature, but they are ordinarily more apt to be slow and insidious and less likely to be incriminative of the therapeutic procedure employed.

In conclusion, he states that he cannot refrain from expressing his opinion that vigorous mercurial treatment is often responsible for arsenical intoxication when arsphenamine and mercury are used at the same time. Large doses of both ought not to be employed synchronously. When the two are used jointly their respective dosages should be inversely proportional to each other. It would appear best to give the courses of mercury subsequent to that of arsenic.

A Technique of Intramuscular (Epifascial) Injection.

In the *Medical Record* of April 30, 1921, STOKES gives the following description of a mode of procedure which has proved serviceable in about 40,000 injections.

His experience with the injection of large quantities of solutions (100 Cc. or more) into the buttocks directed his attention to a phenomenon which suggested that the contents of the so-called intramuscular injection when properly introduced are deposited not within the body of the gluteus maximus or between its fasciculi,

nor yet within the subcutaneous fat, but in the areolar tissue on the upper surface of the fascia forming the extension of the fascia lata covering the gluteus maximus. A large quantity of fluid when thus injected, instead of forming a tense induration in the body of the muscle or spreading laterally onto the hip and thigh or appearing at the sacral margin, presents promptly at the lower border of the buttock in the gluteal sulcus. The markedly better absorption thus obtained and the freedom from local irritation even on the injection of a highly irritating drug were demonstrated by the work of Wechselmann and Eiche, who advocated this technique for the comparatively painless and uncomplicated administration of arsphenamine intramuscularly. A similar principle may be employed in the administration of the mercurial preparations into the tissue of the buttock with equally satisfactory results. The technical detail necessary to achieve this end, and the avoidance of other familiar complications of intramuscular injection such as deep and superficial infiltration, embolism, necrosis, and abscess formation, may be briefly described as follows:

Injections into the buttock are given to best advantage with the patient lying prone on a table. Other positions induce tenseness of the tissues, which favors leakage of the injected substance along the needle track, makes a careful estimation of the depth of tissue and the placing of the needle difficult, and also makes it difficult to avoid mechanical awkwardness in carrying out the procedure.

Relaxation after the patient assumes the prone position should be complete. Attention to certain details assists in securing a satisfactory coöperation on this point. The patient should drop his arms over the side of the table. His legs should be placed in a position of moderate internal rotation "toed in." The difference in the appearance of the buttock when the patient attempts to keep the heels together is marked. Dimpling of the lower outer quadrant of the buttock disturbs the anatomical rela-

tions, is a sign of incomplete relaxation, and is the position ordinarily assumed by every patient who fears the introduction of the needle.

The instruments to be used are a 2-Cc. glass Luer syringe and three lengths of needles: one for very thin or flabby buttocks, one for medium, and one for fat buttocks, are necessary. The withdrawal of the piston a short distance to detect the presence of a needle in a vein makes possible the use of a smaller gauge needle than that required when the venous pressure alone is depended on to yield a flow of blood from a misplaced needle. His preference is for 22-gauge needles 1.5 inches, 2 inches, and 2.5 inches from the tip of the hub to the point.

Injections into the buttock should, in general, be given into the upper outer quadrant near its inner angle. If the injection is given into the upper part of the outer quadrant or into the inner quadrant near the sacrum, even a short needle is likely to strike bone, or the injection of the irritant substance above the periosteum or about the roots of the sacral plexus will give rise to induration and pain, and may, as Neisser points out, induce an obstinate sciatica. Injections given into either of the lower quadrants are subject to pressure on sitting, and are correspondingly painful. If administered near the great sciatic nerve a neuritis may result. Such injections, moreover, cannot be deposited on the fascia with the exactitude possible in the upper outer quadrant, and for this reason are likely to give rise either to superficial nodule formation, abscesses, or deep firm indurations.

The syringe and needle may be sterilized with alcohol. The alcohol should be thoroughly expelled from the syringe and the needle wiped with sterile cotton moistened with alcohol. The emulsion is then aspirated into the syringe through the needle which has been previously attached, and the needle is again wiped. The syringe is grasped in the right hand. The left hand is placed flat on the buttock and with mod-

erate pressure is drawn firmly downward toward the patient's heel, thus flattening and fixing the tissues. The syringe is introduced to its full length by a quick stroke at an angle of approximately twenty degrees from the vertical in a sagittal plane, with a slight inclination inward. The removal of the left hand slightly increases the slant of the syringe. During the process of introducing the needle the piston must be controlled by the pressure of the index-finger against it above the barrel, to prevent the leaking of a solution or thin emulsion.

As soon as the needle is introduced the syringe is steadied with the left hand while an attempt is made to aspirate by pulling upward on the piston with the right hand. This attempt should be continued for at least ten seconds. This in his experience is an entirely safe and much more trustworthy method of detecting puncture of a deep vein or capillary than is the mere detaching of the syringe or the introduction of an empty needle in the expectation that the pressure of the blood in a capillary vessel will cause a backflow of emulsion or of blood, as the case may be. He has never seen an accident of any type occur if the aspiration step in the technique was rigidly adhered to. As soon as it appears that nothing can be aspirated from the deep tissue about the needle point, the contents of the syringe may be injected, the right hand maintaining the proper angle of the needle.

It is not necessary in this technique to use a sign, such as Wechselsmann's torsion sign, for demonstrating that the needle point is near or on the fascia. The site of the injection, the length of the needle when properly adapted to the type of buttock, the fixation of the tissue with the left hand, and the position of the syringe when introduced, soon become matters of habit and seem to place the injected material in such a way that induration is a very unusual occurrence. The flow of injected material into the tissue should be free and the needle point should not "feel" as if stuck in a board. A little experience soon enables one

to control the technique by recognizing the deep, painful lemon or orange sized induration that has followed on too deep injection (intramuscular) and the hazel-nut to hickory-nut sized nodule in the skin or panniculus secondary to too superficial injection or to leakage along the needle track.

Deposition of injected material along the needle track is avoided: first, by securing complete relaxation; second, by using a small caliber needle; third, by completely emptying the syringe before withdrawal; fourth, by a rapid withdrawal; fifth, by quickly pushing the tissues which have been drawn downward by the left hand back to their normal position like a sliding valve the moment the needle is withdrawn; and sixth, by light massage with a cotton pledget over the site of puncture, which results in a rapid flattening out of the injection mass in the areolar tissues over the fascia. In buttocks which have been rendered fibrous by repeated courses of intramuscular injections, leakage cannot be prevented, and the intramuscular injections must ultimately be abandoned.

Attention to several additional details materially contributes to a uniformly satisfactory technique. It goes without saying that the buttocks should be used in alternation for injection. Needle points should be of a rather long bevel and exceedingly sharp. The use of a needle with a bent point is very painful. In wiping the needle a bent point can be detected by a grating sound and feel as it passes over the cotton, often when it is scarcely visible. The operator may unconsciously turn the point of his needle by touching it against the bottom of his bottle of emulsion or solution when filling the syringe. For this reason every movement of the needle should be carefully controlled and it should never be brought into contact with hard substances. A needle which has been allowed to become rusty, corroded, or pitted will also bring a protest from the patient.

The breaking of a needle is one of the most unpleasant complications of intra-

muscular injection and may be due, first, to an incorrectly placed puncture which causes the needle to strike on bone, fracturing it at some point along the shaft; second, to a sudden movement on the part of the patient, especially if the point is caught in the fascia or lies in the muscle; and third, to weakening of the needle by internal or external corrosion. The first cause seldom operates except as a result of gross misjudgment. The second can usually be avoided by an effort to secure the coöperation of the patient and by guarding against sudden movement in those in whom coöperation cannot be expected (children for example). The third cause can be controlled by frequent inspection of needles with a forcible attempt to bend the shaft on the hub. If a steel needle is used for corrosive solutions, its life will be short and inspection must be frequent and critical.

If a needle breaks do not exclaim or discuss the situation with the patient or the nurse; second, keep the left hand in position until an attempt can be made to recover the needle. The usual point of fracture is at the juncture of the hub and shaft and with an assistant at hand the fragment just beneath the skin may sometimes be recovered by a small incision and with the aid of a hemostat if the operator keeps his presence of mind. On the other hand, the moment the left hand is released from the buttock the needle is lost and can usually only be identified by the Roentgen ray and removed through an extensive surgical incision. Such situations are so embarrassing that the finest types of steel and tempered gold needles should be used for intramuscular work.

In the use of insoluble suspensions for intramuscular injection a word of caution as to the preparation of the suspension is important. Concentrated suspensions requiring small amounts for each injection are often less painful than thin suspensions. An insoluble preparation made up in a fluid base settles rapidly, and the collected powder can only be returned to suspension by from five to twenty minutes' persistent

vigorous shaking, and kept in suspension by shaking after each injection. The suspension may appear entirely homogeneous when a considerable portion of the solid material still adheres to the bottom of the bottle. A satisfactory test of complete suspension consists of shaking until none of the suspension can be recognized in the groove at the juncture of the sides and bottom of the bottle when the bottle is inverted.

If blood is obtained on aspiration after the introduction of the syringe, even in the minutest amount, the syringe should be withdrawn and the procedure repeated 1 cm. or more from the site of the unsuccessful attempt. To continue the injection in the face of a return of blood or even a tinged suspension may be attended by fatal consequences from embolism.

Superficial indurations or nodules may be treated by painting them once or twice a week with iodine and requesting the patient to pinch and massage them between the thumb and forefinger. Deep indurations attended with pain from injection below the fascia are much relieved by prolonged hot applications and massage. Indurations seem to occur with special frequency in certain subjects, especially the obese, and are sometimes unavoidable even with the best technique. Each node represents a certain amount of encapsulated mercury which may be abruptly released for absorption by trifling trauma, such as that of sitting down more heavily than usually. The sudden onset of salivation in patients who have not had intramuscular injections of insoluble mercurial salts for a considerable period may be to some extent a result of technical errors which have interfered with absorption. There can be no object in continuing a method of administration in which persistent nodule formation, even with a careful technique, shows that the drug does not absorb.

Pain referred down the leg has always in Stokes's experience been evidence of the technical error of injecting too deep or too near the sacral plexus and the great sciatic nerve.

Pulmonary embolism following the use of insoluble salts, such as mercury salicylate, calomel, and gray oil, probably cannot be absolutely avoided, but should be an excessively rare occurrence. The symptoms of pulmonary embolism may vary from a slight and transient cough after the patient rises from the table to evidences of extensive pulmonary infarction with severe and persistent cough, rise of temperature, pleural irritation, and occasional pneumonic complications. Pulmonary embolism may occasionally supervene some hours after an injection made in accordance with the strictest technical exactness. Cerebral embolism is exceedingly rare.

Abscess formation he has seen only twice in 40,000 injections. The abscess is usually sterile and resolves promptly on evacuation. A certain percentage of deep indurations doubtless undergo central softening, but under rest and hot dressings the process subsides.

The Antidiuretic Effect of Pituitrin in Diabetes Insipidus.

In the *Ohio State Medical Journal* for April, 1921, MICKLETHWAITE states that the difficulty with this line of treatment is that the effect is not lasting and that two injections daily are necessary to keep down the quantity of the urine and to raise the specific gravity. The practical application of this fact is at once manifested in life insurance and other diagnostic examinations.

The control of diabetes insipidus by the use of pituitary extract has been dealt with recently by Barker, Hodge, and Mosenthal in rather exhaustive papers. Davidson refers to some interesting observations by Kennaway and Mottram upon the anti-diuretic effects of pituitary extract in diabetes insipidus, with a detailed account of two cases, and in view of the comparative rarity of this condition he records the notes of a case under his own care in which injections of pituitrin were given and observations made upon the total output of urine in the twenty-four hours, as well as notes on the amount and specific gravity of

the samples collected at frequent intervals after the injections.

The injections were always followed by an action on the bowels and on the first occasion by vomiting, but except for this no untoward effects were observed. Apart from the discomfort and annoyance of the symptoms the patient suffered no inconvenience beyond that of a slight bronchitis, which yielded to treatment. There were no symptoms or signs to suggest any associated disorder of the pituitary gland.

Davidson's case was a man passing a urine of 1.002 with polyuria. He received one ampoule of pituitrin (S) twice a day hypodermically. The urine was decreased and its specific gravity rose to 1.012.

Micklethwaite's case was an ex-soldier, aged thirty-five. He had always been a healthy man until he was invalided from the Salonika front in the winter of 1917 with bronchitis and nephritis. He was sent back to England, and while in the hospital at Malta, en route, he began to complain of polyuria for the first time. He was treated for bronchitis and asthma, but no special attention was paid to the other condition.

On admission to the hospital his condition was as follows: He was a healthy looking, well-developed man. He complained of some cough and a great thirst, and continued polyuria. On examination he had signs of some bronchitis; medium rhonchi were audible all over both lungs without moist sounds; there was a moderate amount of expectoration. He was treated for this with belladonna and stramonium, and the physical signs in the chest cleared up. The heart was normal. There was no sign of edema of the face or legs, nor was there any albuminuria. His visual fields were not diminished; the appearance of the fundus oculi on both sides was normal. A skiagram of the skull showed no abnormality of the sella turcica. From the time of admission he suffered continually from intense thirst, and was allowed as much water as he wanted day and night. The urine was pale, acid in reaction, of low specific gravity (1000),

and contained no sugar or albumin. The amount passed per twenty-four hours averaged just over 300 ounces.

It was decided to administer hypodermic injections of pituitary extract in order to observe its effects upon the diuresis, and to see whether after continuing the injections for some time any permanent or lasting effect was obtained. The antidiuretic effect of the pituitrin was such as to cause an appreciable diminution in the total excretion of urine in the twenty-four hours. The effect was much more pronounced during the period shortly following the injections.

Several doses of pituitrin were given by the mouth, but without any appreciable effect upon the amount of urine secreted.

The Nutritive Value of Soya-bean Flour as a Supplement to Wheat Flour.

In the *American Journal of Physiology* for April, 1921, JOHNS and FINKS state that bread made with a mixture of 25 parts of soya-bean flour and 75 parts of wheat flour contains a protein mixture and water-soluble vitamins adequate for normal growth. A similar bread containing 15 parts of soya-bean flour and 85 parts of wheat flour likewise furnishes adequate proteins and water-soluble vitamins for normal growth.

These mixtures of the soya-bean and wheat proteins were found two or three times more efficient than the proteins from wheat alone.

Anesthesia in Obstetrics.

In the *Ohio State Medical Journal* for April, 1921, the editor makes the following note in reference to Arthur H. Bill's article on this subject:

In striving for the ideal in the pain-relief of labor it is common sense to know all methods intimately, to be prepared to resort to any, and to select the best features of all according to the demands of the particular labor which is being conducted, the

condition of the mother and unborn child, as well as the facilities at hand. At the present time labor may indeed be made very comfortable. The pains of the first stage may be controlled by the judicious use of alkaloidal amnesia. The pains of the second stage may be mitigated by the use of nitrous oxide or ether, and the stage of expulsion by a combination of both. Bill again sounds the warning that pregnant and laboring women are not immune to the dangers of anesthetics when carelessly given. He has discarded the use of chloroform in labor and substituted the use of ether or nitrous-oxide-oxygen according to indications. The administration of anesthesia during labor is an art in itself, and is best accomplished by an obstetrician who is thoroughly familiar with anesthesia or an anesthetist who knows much about obstetrics.

Basal Metabolism as an Index of Treatment in Diseases of the Thyroid.

In the *Boston Medical and Surgical Journal* of April 7, 1921, LAHEY and JORDAN state it is their opinion that there is hardly a surgical disease in which caution is as necessary as in the cases of marked thyrotoxicosis. As it approaches the higher levels of toxicity, as indicated by clinical signs and increases in metabolic rates to high levels, each case should be individualized and no longer looked upon as being a member of a group. After such cases have reached the more intense stages of thyroid intoxication, they no longer conduct themselves by rule. This statement is more or less true of hyperthyroidism as a whole, but is particularly characteristic of the intensely toxic cases. After an extensive experience with thyroid cases, they feel able to prophesy with relative certainty the course and reaction of mild and moderate degrees of thyroid intoxication to various surgical procedures, but have by no means the same degree of assurance regarding the intensely toxic cases. It is because of this unknown capacity for unfavorable reaction on the part of severely

toxic cases that extremely cautious advance should be made. First, the degree of reaction to the slight discomfort and apprehension which goes with the estimation of basal metabolism, next the reaction to a visit to the operating-room and short gas-oxygen anesthesia, and finally, based upon this data, the ligation of a single thyroid pole. Having advanced so far, they have accumulated sufficient data upon which to base with reasonable certainty a decision as to the probable outcome with further surgical procedures.

Thyroid toxicity, if for practical purposes we consider the disease in terms of toxic thyroid products, is represented by increased basal metabolic rates, and there can be little question as to what to do. One has but to observe the charts shown and note the metabolic rate before operation—the progressive drop in the metabolic rate and pulse rate after ligation and again after partial thyroidectomy, together with the progressive clinical improvement in the patient, going hand in hand in most instances with the drop in metabolic rate—to be convinced that metabolic rate quite accurately represents degree of toxicity.

That basal metabolism represents true terms of toxicity, which in turn may be used to estimate ability to withstand surgical procedures, is as uncertain as the level of basal metabolic rate alone is quite undependable, and in fact often misleading as a means of prognosticating the seriousness of the patient's state and her ability to endure any surgical procedure. They have had surgical experiences with patients showing metabolic rates at both extremes, in which the course and results of the operative procedure have been entirely out of accord with what might have been expected from the metabolic rate.

They have, for example, operated upon patients with a basal metabolic rate of $+26$ with a hyperthyroidism of long standing, and seen an extremely well-marked operative and postoperative reaction. On the other hand, they have operated upon patients with metabolic rates around $+60$ or over, but with a hyperthyroidism of

short duration, who have shown much less operative and postoperative reaction than have the patients with a rate of $+ 26$ as spoken of above.

It is their feeling that one must consider—in estimating the operative risk—not only the degree of toxicity, but also the cardiac reserve as estimated by the

rate, rhythm, and character of the pulse wave, by the length of time the disease has been present, and by the history and signs of past or present indications of unsettled compensation, and the destructive effect of the disease on other structures, as indicated by varying degrees of nervousness, tremor, and loss of weight.

Surgical and Genito-Urinary Therapeutics

The Treatment of Congenital Hypertrophic Stenosis of the Pylorus by Rammstedt's Operation.

RAMSAY (*British Journal of Surgery*, April, 1921) reports on 20 cases with a mortality of 50 per cent. He states that the most frequent causes of death after operation are diarrhea and high fever. He also records recurrences of symptoms. He notes that the operation of dividing the hypertrophied muscular coat in the axis of the pyloric canal, leaving the mucous membrane intact, and using no sutures to close the gap, was first described by Rammstedt in 1912 and was evolved by accident rather than by design.

The stomach is washed out before operating. An incision is made $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in length, in the middle line, extending downward from the tip of the ensiform cartilage. As soon as the abdominal cavity is opened it is well to secure the cut edges of the peritoneum before they contract and thus avoid delay when the time for closure comes. When the lower edge of the liver has been hooked upward, the stomach appears in the wound. The diagnosis having been confirmed by feeling the pyloric tumor with a finger introduced into the abdomen, this tumor is brought out of the wound; in some cases it can be hooked up by the examining finger; in others, pushing the stomach backward and to the left may cause it to present; or, in the case of a greatly dilated stomach, it may be necessary to exert gentle traction upon the exposed part

of this organ and so bring the tumor within reach. The pylorus being delivered, the extent of the hypertrophy is carefully defined by palpation, and with the tumor held firmly in the left hand a longitudinal incision is made upon its anterior surface in the relatively bloodless area lying between the terminal branches of the vessels running along its upper and lower borders. The incision should divide the whole of the hypertrophied muscle; it should be deepened carefully at first in the middle or thickest part, the left hand drawing apart the edges of the incision until the deepest part of the muscle is divided and retracts, exposing the thick white mucous membrane, which at once protrudes. The incision is then prolonged toward the stomach and duodenum until all the thickened muscle is divided. Great care must be taken not to wound the mucous membrane, especially at the duodenal end of the incision, since here the hypertrophy ends abruptly and protrudes into the lumen of the intestine, producing a cul-de-sac of duodenal mucous membrane which may easily be injured. When the muscle has been completely divided, the edges of the incision retract and the redundant mucous membrane bulges freely into the gap. Hemorrhage in the form of oozing may occur, especially at the end of the incision which encroaches on the stomach; this can usually be controlled by hot sponging, but if, as sometimes occurs, a definite bleeding point is responsible, it should be under-run and ligatured with fine catgut.

The patency of the canal may be tested by gently squeezing the stomach, and this precaution also serves to demonstrate the absence of macroscopic perforation of the mucous membrane. The pylorus is now returned to the abdomen, and the liver allowed to fall into place.

The closure of the abdominal wound is begun at the lower end, since it is here that protrusion of abdominal contents is most likely to occur; a continuous suture of fine silk closes the peritoneum and aponeurosis in one layer, and a continuous blanket suture of silk or fishing-gut is used for the skin. Dressings having been applied, the patient is returned to a warm bed, saline with brandy is given per rectum, and feeding is begun as soon as possible.

Spinal Curvature in Growing Children.

This condition is so little understood by the general profession, so often overlooked, and treated so spasmodically or ineffectually, or in a manner which, from the restrictions it implies, make it prohibitive to the average indulged child, and as to its underlying causes is so vaguely classified, that an article on the subject by a recognized authority, one whose sound common sense has not been obscured by special training and one who has been especially concerned in the study of ultimate results, is particularly helpful.

BRADFORD (*Boston Medical and Surgical Journal*, May 19, 1921) states that if a growing girl is brought to a doctor's office for advice as to the treatment of a slightly projecting shoulder or hip, the surgeon will often find it difficult to form a definite opinion as to the probability of benefit to be expected to follow treatment or the danger of increasing deformity if thorough treatment is not followed.

The treatment commonly employed in the severe forms of the deformity is of doubtful advisability in slight cases, while simple postural or gymnastic measures cannot be relied upon to correct twisted bone. To enable the physician to form his opinion more definite information is wanted.

In a growing child with round shoulders, the spine is either stiffened abnormally in some parts of the column, or the flexibility is normal. The same is true in side curves. These differing conditions need different treatment, and if commencing scoliotic rotation is present, more rigorous measures are needed.

Bradford states that records of spinal flexibility can be made of sufficient accuracy by marking on a plate of transparent glass, against which the patient's back rests when he or she is standing up straight, and also when leaning to both sides. A pencil mark on the spinous processes is seen through the glass; this is marked on the glass, and a record of the side flexibility of the column is made. This method will help in detecting commencing stiffness of spinous ligaments, localized irregularly shaped cartilage or bone. In recording anterior curves another method is needed, as the projecting scapula masks the real spinal lines of the patient as seen from the side.

These observations will enable the surgeon to determine whether it is necessary to stretch shortened tissue or whether the muscular or postural treatment will be sufficient. The curves of the flexible spine will disappear when the patient is recumbent. In the erect position the flexible spines sag under their load if the muscles are weak or easily tired. The principles of treatment are that easily tired backs should be properly rested, weak muscled backs should be strengthened, and stiffened parts of the column should be made as flexible as possible.

Any one familiar with inspection of the schoolchildren of our communities is aware of the faulty figures too frequently seen. This is by no means more noticeable among the poor; in fact it has appeared, in some localities, that the richer class is poorer in respect to the vigor of the carriage, even in childhood.

Few, if any, American physicians would condemn a healthy growing girl to a year's exile of half-bed life and gymnastics, or to six months of a spinal couch in a special institution, or to the wearing for years of clumsy, heavy corsets, merely because the

bared back showed to apprehensive parents an abnormality in contour, with the only promised benefit from such rigorous treatment that the curvature would be prevented from increasing.

Spinal curvatures, in most instances, are not to be regarded as a definite disease to be treated medically or symptomatically, but as a fault in growth. Treatment is not simply the correction of the curves so much as the guidance of the growth to a normal standard of carriage or trunk shape.

The chief causes determining spinal curves may be understood without difficulty: The spine of the new-born is flexible, bending in several directions, forward, backward, sidewise, and capable of twisting on itself to a limited degree. In the upright position it curves and cannot be held erect until the muscles gain their normal strength. With strengthened muscles, the erect attitude is assumed with a balanced spine with slight normal, forward and backward curves, adequate flexibility, and proper rigidity for erect locomotion and adjustment to changes of position. Abnormal curves come if there is muscular weakness, causing undue sagging of the spine, or if curved attitudes are too often or too long assumed by an inadequately resistant spinal column. What these curves will be depends upon the extent of the load carried and its direction. Abnormal curves vary according to definite classifiable types, namely, forward and backward curves, side curves, single and double curves with twists, curves with stiffening tissues and changes in the shape of the bone structures.

The causes of differing abnormal curves are many and not easily recognized: their action is gradual and may be checked by increased structural resistance of the vertebral bodies. In the progressing cases the abnormal curves increase until they become more or less fixed with structural changes of ligaments, fascia, muscle, cartilage, and bone. The rotation of the vertebræ as the abnormally curved column is subjected to downward pressure beyond its resistance, drags with it the connected ribs, and characteristic deformities result.

While in the earlier stages the curves

and twists are more or less correctible, they may become rigid and unyielding with marked structural changes from abnormal strain and pressure.

For the general practitioner, and the management of spinal curvature cases, a practical grouping will be of convenience:

1. Habit curves in healthy backs.
2. Weak backs, with weak muscles or back tissues.
3. Twisted backs, with varying resistance to connecting pressure.

The physician will be aided in forming his opinion as to the proper management of cases by informing himself as to the child's rate of growth, ratio of weight to height (compared with normal standards), the child's general condition, habits of activity, and commonly worn clothing. He should bear in mind that while certain variations in the forward and back curves of the spinal line may fall within the normal limit, marked hollow backs, flattened chests, projecting shoulder-blades, are not normal, and that a lack of symmetry in the slope of the shoulders, the side lines of the trunk and hip, as seen from behind, is not normal, nor is a difference in the distance of the tips of either scapula from the spinal line (that is, the line of the spinous processes) normal. The spinal line seen from behind is straight in the erect standing position, and bends equally to either side in side bending.

Habit curves should not occur in healthy children with a normal environment. If observed in children of good physical development, faulty attitudes in sitting, ill-suited chairs commonly used, indolent habits, or constricting clothing are all to be considered as possible contributing causes. The best treatment for this condition is a daily drill of simple setting-up exercises, with removal of any faulty conditions of seating or clothing. Specific directions for active play are essential. The fact that the greater part of the waking day in a child's life is spent seated with the back muscles but little exercised, the back partly supported and partly stretched, the child leaning against an ill-fitted chair-back, cannot be ignored.

Whether backs are weak from a lack of bone tissue resistance, or lack of firmness of ligament, or more from a lack of muscle tone, the condition of weak backs in children needs treatment.

Where there is a twist as well as a curvature, mechanical correction is required, either by intermittent or constantly applied pressure. This calls for specialized treatment.

In attempting to stretch spinal curves, the load should be removed from the spine. This is done most conveniently to the patient when in the semirecumbent position, and properly adjusted straps for head and side pull, attached to pulling weights, can be arranged to give correcting pressure for any desired time and to any extent.

A board sloped to any desired angle, furnished with a seat to prevent the patient from sliding down on it, enables a tired back patient to rest and offers a proper position for correctly stretching. If upon the trunk of a patient lying on the reclining board a short board is placed, and the sides are strapped to the reclining board, any amount of pressure can be made on the twisted and projecting ribs and correction made on the spinal rotation. This intermittent correcting pressure is suitable for slight degrees of twists in young patients, to whom the constant pressure of plaster jackets is inapplicable when the muscle weakening effect of a heavy corset cannot be disregarded. Daily rest of the column can be furnished by the prescribed use of the reclining board.

Elaborate gymnastics and postural movements requiring supervision are not well suited for home treatment, which necessarily forms an important feature in the treatment of so chronic an affection as spinal curvature.

Besides the usually prescribed dumb-bell and weight-pulling exercises, patients with spinal curves should be directed to carry daily, for a stated time, upon the head, a basket containing specified weight. This gives both poise and strength to the spinal column and is an exercise suited to home direction.

Even after spinal muscles have been

strengthened and abnormal stiffness of spinal curves has been made more flexible, the patient often needs to avoid habitual faulty positions. This may be done by conscious efforts on the part of the patient or may require mechanical restraint. Cumbersome, heavy and disfiguring appliances are to be avoided. The appliances are either restraints or are to exert some correcting pressure.

A simple unnoticed check rein can be used to restrain a round-shoulder attitude, the method of applying which is more satisfactorily figured in a picture than is the description set forth in the text.

A stiffer correction can be provided by a light spring steel bar cut long enough to reach from the neck to the buttock, and to this is fastened a shorter cross-piece at the level of the axillary line; webbing straps are connected with the ends of the steel bars and passed around the shoulders, hips and neck and buckled to an abdominal cloth piece, thus securing an erect attitude as long as this brace is worn, which can be done under the clothing.

In side curves, a similar steel spring strip can be used, but the cross-piece should extend on the side of the back only and be attached to a strip of webbing, which, passing around the lower shoulder, is connected to the top of the steel bar. At the lower end of the steel another steel strip is fastened, extending from the middle of the back to the rim of the ilium. If to these broad webbing bands are attached and passed around the hip on one side, and the prominent shoulder on the other, and tightened in front, a satisfactory correcting pressure is secured for cases of slight side curves.

Bradford states that cases of flexible curves without structural changes in reasonable good health, with either anterior or side curves, can be expected to be restored to normal contour under proper guidance. This result can also be expected where some abnormal stiffness is present, though special pains may be required to overcome faulty stiffness. Even with rotation, projecting shoulders or hips in young children can be improved. In healthy adolescents these

curvatures and deformities can be prevented from increasing.

Bradford closes his article with the conservative statement that the surgeon can avail himself of a number of serviceable measures which enable him to meet the surgical indications of a slowly changing distortion, checking its progress, and, in some cases, correcting deformity.

Tetanus in the British Army During the European War.

CUMMINS (*Journal of the Royal Army Medical Corps*, May, 1921) reports that although the hope was entertained at the beginning of the war that tetanus might be successfully controlled, the tetanus cases, although greatly diminished in numbers, continued to occur. The prophylactic administration of antitoxin became almost universal in 1914, when adequate supplies of antitetanic serum became available, and so continued up to the conclusion of hostilities. This universal inoculation deprived statisticians of any large uninoculated "control group."

The following rules for the prophylactic administration of antitetanic serum were drawn up by the committee for the study of tetanus in the British army and have given satisfactory results.

The first prophylactic dose should be given as soon after wounding as circumstances permit, and should be not less than five hundred U. S. A. units of antitoxin.

As there is both clinical and experimental evidence that the immunity conferred by an injection rapidly declines from about the tenth day onward after administration, and as the appearance of a wound affords no indication whether it is infected with tetanus or not, it is recommended that all wounded men should receive at least four injections of antitetanic serum—a primary injection given at or shortly after the time of the wound, and three others.

The second injection should follow the first at an interval of seven days. The third and fourth injections should follow at as nearly as possible the same interval of time.

While these rules are thoroughly sound, they are not always easy to carry out in strict detail when very heavy fighting is in progress. The initial dose is naturally the most important, and it has been found possible to give it in practically every case within the first twenty-four or forty-eight hours after wounding. The second and subsequent doses are of undoubted value, but they are less easy to insure. It is often difficult to arrange for reinoculation at the right interval during the various stages of evacuation of a wounded man from the front to the base and thence to home territory. Again, the condition of the patient may be such that the surgeon may hesitate to add to his burden by even so much as an injection of serum. But it has been found possible to give the reinoculations at or about the intervals recommended, in the majority of cases with very satisfactory results. Whether these successive injections be given or not, one rule is of cardinal importance:

A precautionary dose of antitetanic serum (500 units) should invariably be given at the time of any operative measures at the site of the wound.

But while the effect of the routine use of prophylactic injections of antitetanic serum has been so great in diminishing the case-incidence of the disease, its value is by no means confined to mere prevention of tetanus. It can be confidently claimed that these injections have acted beneficially in at least four ways: In reducing the case-incidence of tetanus; in diminishing the case mortality; in extending the incubation period; in modifying the severity of the disease.

In 1914-1915, Sir William Leishman recorded in the hospitals of the British Expeditionary Force, France, 178 observed cases with 140 deaths, a mortality of 78.2 per cent, while Sir David Bruce, collecting his figures from hospitals in Great Britain, reported 231 cases with 133 deaths, a mortality of 57.7 per cent.

Adding these early and late cases together as a sample of the tetanus mortality of the first year of the war, there were 410 cases

with 273 deaths, or a mortality of 66.6 per cent.

In 1916-1917, in a series of 376 cases reported from France by Colonel Cummins and Major Gibson, there were 252 deaths, or 67 per cent. For the same period Sir David Bruce reported, from England, 400 cases with 79 deaths, or 19.7 per cent. Adding these early and late cases together, we get a record of 776 cases with 331 deaths; a mortality of 42.6 per cent.

The total mortality in a third group of cases from British hospitals in France and England in 1918 shows a slight rise to 48.8 per cent, owing, doubtless, to the unfavorable conditions for the treatment of wounded necessitated by the retreat in the Somme area in March.

Of fifty cases of tetanus in non-inoculated persons arising in France in 1918, only nineteen were in men wounded in battle. Of these nineteen cases sixteen died, a mortality of eighty-four per cent; just such a mortality as characterized the tetanus of older wars before serum was introduced.

In the same period 136 wounded and inoculated men developed tetanus. Of these seventy-five proved fatal—a mortality of 55.1 per cent.

Another significant comparison may be made between those to whom antitoxin was given within twenty-four hours of wounding and those to whom it was given at a later period.

Of 269 men inoculated within twenty-four hours of wounding, 170, or 63.2 per cent, died.

Of sixty-nine men inoculated at a longer interval than twenty-four hours after wounding, fifty-three, or 76.8 per cent, died.

Again, where cases have received only one protective inoculation, the mortality has been less amongst those who received the larger doses. For instance, in 1917, there are records of 119 tetanus cases in men to whom a single dose of 500 units was given; of these, ninety died, a mortality of 75.7 per cent. In the same period thirty-nine cases had received 750 units or more; of these, seventeen died, a mortality of 43.5 per cent.

It may be stated as a proved fact that the

mortality of tetanus was definitely less in those cases to which prophylactic inoculations had been given, and especially in those to which it had been given early and in large quantity.

The conclusion seems inevitable that the use of antitetanic serum has been a factor of the greatest importance in prolonging the incubation period of tetanus.

We are, then, in a position to state definitely that the prophylactic use of antitoxin not only diminishes the case-incidence of tetanus, but also leads to a prolongation of the incubation period and a reduction of case-mortality.

Captain W. J. Tulloch, R.A.M.C., working for the war office committee for the investigation of tetanus, has been able to show, by serological differentiation, that there are at least four separate types of tetanus bacilli operative in war wounds. Of these, Type I corresponds to the organism employed for the preparation of the toxin used in manufacture of antitetanic serum.

Tulloch has shown that, while serologically distinct, all four types produce exactly the same toxin. The antitoxin in general use is, therefore, equally effective in neutralizing the toxin in all four types of infection.

But further work by this investigator has pointed strongly to the conclusion that it is not only the toxin that matters, but that the power of invasion by the bacteria themselves plays an important part in the production of tetanus. Tulloch has isolated all his bacterial types from both tetanus cases and also from septic wounds in patients in whom tetanus did not develop.

Figures appear to indicate that, when tetanus develops after excision of the wounds, it tends to assume a benign rather than a severe type. It is not desired to claim too much for these very small figures. All that can be said is that, as far as they go, they support the conclusion that effective surgical intervention helps very largely in lessening the incidence, the severity, and the case-mortality of tetanus.

This conclusion is so obviously in agreement with bacteriological and physiological facts that it is unlikely to be seriously questioned.

It is now generally admitted that, once tetanus toxin has entered into combination with nerve tissue, the presence of antitoxin in the circulating blood and lymph cannot lead to dissociation of the toxin.

It is known that the presence of antitoxin in the circulation can neutralize its equivalent of circulating toxin.

The experiments of Meyer and Ransom have shown that the toxin travels along the axis cylinders of motor nerves. Teale and Embleton, while confirming this observation, have shown that the toxin also travels along the perineural lymphatics. Antitoxin cannot travel along the axis cylinders, but it can and does travel along lymphatic vessels and circulate in the blood stream.

It seems probable from these considerations that the most that can be hoped from antitoxin in treatment is that it will, if given in sufficient quantity, neutralize all circulating toxin.

Whether recovery can take place will depend on how much toxin has already combined with nerve tissue, and how far the antitoxin can neutralize the poison formed at the infected site and prevent its effective passage along motor nerves. One very hopeful feature is the success attained in preventing a fatal issue in animals, to which a lethal dose of toxin has been given, by means of subsequent injection of antitoxin.

Dr. F. Golla, from a careful study of a series of reported cases, shows that, in cases of tetanus in men to whom no prophylactic injection has been given, but who were treated with antitetanic serum after the development of the disease, the rate of mortality approaches closely to that of tetanus without such treatment, tending to show that the employment of antitetanic serum in treatment is of no value at all.

Sir David Bruce, whose successive series of analyses of tetanus cases in hospitals in England have been such a valuable contribution to this subject, remains, at the end of the war, uncertain whether serum therapy in tetanus is of any use.

Taken as a whole, the figures do not amount to evidence of the least statistical importance in favor of serum therapy. As

to the different routes of administration, practically every case received serum in more ways than one, but very general use was made of the intrathecal and intramuscular routes.

There is no evidence to show that one method was markedly superior to another, but the tendency was evidently to conform to the recommendation of the War Office Tetanus Committee and make use, for preference, of intrathecal and intramuscular injections.

The conclusions which the author draws from the information gained upon the subject of tetanus in the late war were as follows:

The almost universal use of antitoxin for prophylactic inoculation has greatly diminished the incidence of tetanus as a complication of war wounds.

There is reason to hope that, by following up and applying the new knowledge gained by Dr. Tulloch as to types of tetanus bacilli, it may be possible to still further increase the prophylactic efficacy of antitetanic serum in the future.

The prophylactic use of antitoxin has not only reduced the incidence of tetanus, but has also led to a modification of the clinical type of the disease. Tetanus, in inoculated persons, tends to assume a milder form characterized by a longer incubation period and a greatly decreased case mortality. "Local tetanus," without trismus, is common.

The improvement in surgical technique, notably the introduction of early excision of wounds, has favorably influenced the incidence, severity, and mortality in tetanus cases.

There is as yet no statistical evidence to show that antitoxin has been valuable in the treatment of tetanus.

Good results from serum therapy have been claimed by many surgeons, and recent experiments on animals show clearly that under controlled conditions serum therapy can cure tetanus even though administration had been withheld until the onset of spasm. It is therefore advisable to give every tetanus patient the chance of benefit from specific treatment.

If serum is given it should be given in large doses and as early as possible after onset. Intrathecal injections should be given, and these should be supplemented by intramuscular and subcutaneous administration.

Fractures.

Incident to the newer knowledge gained by fluoroscopic and radiographic studies of broken bones, a clearer concept of the factors which impair joint function, a better understanding of the mechanics of the bone from the standpoints of support, leverage, and free motion, and with a large recorded clinical experience, the result of the recent war, the knowledge concerning the proper treatment of fracture, and the results which may reasonably be expected in skilful hands, has advanced far beyond that which is suggested by the treatment thus commonly employed in many hospitals of good standing and under otherwise intelligent management. What has been most needed for years in the consideration of fractures and their treatment is a careful summing of results, from the standpoint of both function and cosmetics. Such a summing has been largely stimulated by industrial surgery, which when it is efficiently conducted saves employers of labor many thousands of dollars. Moreover, the larger industries are the most prompt to advocate and practice measures which are helpful to their employees. Hence, there can reasonably be expected, in a comparatively brief time, a somewhat uniform and efficient method of treatment, and a recognized standard of results, which will insure a general if not universal adoption of the approved measures, and will rob these injuries of the greater part of their present permanent crippling effect. In this relation a number of articles in the *American Journal of Surgery* for May, 1921, are pertinent and helpful.

BLAKE, writing on "The Treatment of Fractures of the Humerus by Suspension and Traction," holds that this method is easy to apply to fractures of the humerus, not requiring nearly as much skill as treat-

ment by splints. Immobilization is achieved by traction, aided to a certain extent by the way in which the limb is suspended. Although the fragments are efficiently immobilized one upon the other, yet motion is permitted at both the shoulder and the elbow.

The gallows frame, consisting of post and arm, is adequate. A full description and illustration of his method are given. To the arm traction is applied, and to the forearm suspension. They can be varied according to indications. He claims for this suspension treatment earlier function caused in the main by better nutrition, due to maintenance of normal circulation.

Hitzrot in dealing with fractures of the head and the neck of the radius gives a useful classification of these injuries. For the marginal fractures he splints the arm with the elbow flexed to a right angle, with the forearm in the middle position between full pronation and supination and kept at rest during the stage of acute exudation and reaction in the superior radio-ulnar joint: usually for five days. Thereafter the arm is rubbed, baked, and the patient is encouraged to use it—that is, to make active movements in flexion and extension within the limits of pain. As soon as the patient finds that these movements can be executed painlessly (and this usually on the tenth or twelfth day after injury), the splint is removed and movements of pronation and supination encouraged. The treatment is continued from four to six weeks, after which time more active movements on the part of the patient, with use of the arm, may be advised. Function is usually restored in eight weeks. The ultimate loss of movement is slight, about 5 degrees of extension and from 5 to 10 degrees of supination. The splint used is one of molded plaster from the middle of the posterior aspect of the upper arm, down the ulnar aspect of the forearm to the dorsum of the hand at the heads of the metacarpal bones. A well-fitting triangular sling is equally satisfactory. Operation is not indicated, nor is any attempt at correcting the slight displacement present needful.

When the head is split into a number of fragments with a fissure traversing the neck close to the attachment of the synovial membrane to the bone, the treatment is as already described, excepting the hand should be carried into as much supination as the patient will permit. Recovery is less rapid, function is more interfered with, and operation is at times needful.

In cases of epiphyseal separation the arm is splinted at right angles in supination for a week, and then carried in a sling. Thereafter the patient is encouraged to use it. The results are good. Restoration of function was in all cases, barring an operative one, complete.

Where the head was fractured with wide displacement of the fragments practically all were operated upon early, in the main by removing the head and neck as far down as the bicipital tubercle.

Removal of the displaced fragment was done twice; the function was not nearly so satisfactory as in cases of complete removal. In these cases of removal of the head and neck of the radius there was a loss of 10 degrees of supination. Flexion and extension were limited to about 5 degrees each way from a right angle by new bone deposited in the capsule of the elbow-joint, and were not improved by any treatment.

Fractures of the neck of the radius were treated by supinating the forearm fully with the use of anterior and posterior molded splints from the middle of the upper arm to the middle of the palm. The splints should be worn for four weeks. Attempts to correct slight displacements are futile. The resulting function is very satisfactory. Flexion and extension are practically normal, pronation and supination are limited to less than 5 degrees.

Mock, writing on "Fractures of the Fingers and Toes," observes that the most important considerations in these cases are diagnosis; proper reduction and splinting with a view to obtaining perfect functional restoration; treatment of the injuries to the soft parts which so frequently accompany fractures of fingers and toes, with the view of first saving as much function as possible in the tendons, nerves and muscles, the

proper alignment and union of the fractures being of secondary consideration; methods best adapted to overcome deformities and to restore function in the hand or foot.

He gives detailed directions concerning treatment based on a large experience in industrial surgery.

Speed contributes a paper on "Intertrochanteric Fracture of the Femur," based on the study of 120 cases. After discussing the various forms this fracture may take, and giving a brief but excellent summary of signs and symptoms, he states that we can anticipate a union in practically every case following a short rest in bed with little immobilization.

As for treatment the indications are satisfied by extending the leg by traction, abducting it to the maximum, turning the foot slightly inward, and placing the patient in a body cast, such as is used for fracture of the neck of the femur. This cast may be worn for six to eight weeks. The patient can then become ambulatory, wearing a caliper for six weeks to take weight off the young callus, moving his hip while not bearing weight.

As to results, there is usually some restriction of hip motions no matter how perfect the reduction of fragments. Where proper reduction and immobilization have not been followed, we may expect shortening up to one inch, seldom more, considerable excess callus which leads to restriction in hip-joint function, and some adduction of the leg on account of the change of neck angle. Bony union, however, permits weight-bearing and a fair degree of function even to old people. The average age of a person suffering these fractures is over sixty-two years. As to the cause of fracture a large majority gave this as a fall on the hip. All instances of intertrochanteric fracture arising in younger patients gave a very definite history of severe direct trauma. In the 120 patients reported 20 died.

Moorhead writes on "Standardized Treatment of Fractures of the Leg." He calls attention to the frequency of non-union in the lower third of the tibia and

the almost total absence of non-union in fracture of the fibula, even in the presence of marked over-riding or gross deformity. Compound fracture of the leg is more prone to infection than any other compound fracture, mainly because the tibia is subcutaneous, with stasis of circulation acting as a contributing factor.

He notes the frequency of blebs, which may be massive and numerous. He cautions concerning the exposed position of the external popliteal nerve, which makes it subject to pressure palsy, and calls attention to the frequency with which a long oblique fracture of the lower third of the tibia is associated with fracture of the upper end of the fibula.

In fracture of the leg with little or no deformity, the part is splinted into a two-piece anteroposterior molded plaster-of-Paris casing reaching from the toes to six inches above the knee. If the fracture is at or above the base of the malleolus the splint does not include the knee. If there is displacement this is corrected at once if possible. If fracture be irreducible operation is indicated. Operation would seem to be indicated, but can often be avoided by what the author calls skeletal traction—i.e., a pull downward and continued until the effect is produced by means of calipers or bands or nails applied to the bone.

As a traction agent the author expresses a preference for the stirrup passed over the os calcis, or the tongs thrust into the malleoli. He holds that in another five years plates now used in the course of operation will be as rarely employed as are wooden-handled instruments. In all forms of traction the direction of the pull is that of the upper fragment, and counter-traction is best obtained by elevating the foot of the bed. Ten- to twenty-pound weights are employed first, so that muscle spasm may be overcome. As soon as this is accomplished the weight of five pounds is enough. Fracture is set not by setting the bone, but by setting the muscles which maintain bony malalignment.

To properly reduce a Pott's fracture anesthesia is needful. Relaxation of the

tendo Achillis is the next essential. Hence the thigh must be folded fully on the abdomen. Next the foot should be firmly grasped and the deformity markedly increased up to the point of obtaining very free false motion and crepitus. Then slow and gradual downward traction is made until a sensation of "giving" is felt. Next the foot is brought as far forward and inward as possible. If the correction is satisfactory the bony deformity disappears, the malleoli are on a proper level, and pressure of one finger against the sole holds the foot at the right angle. A loop of a bandage is then placed around the big toe, and the free end of this is given to an assistant until the patient is out of anesthesia or the splint is in place, the latter being, as already stated, a two-piece molded plaster-of-Paris casing. The posterior portion of this 4-inch-wide strip passes from the web of the toes, along the sole, over the heel, and up the back of the leg to the lower part of the popliteal space. The lateral 4-inch piece begins over the inner malleolus, crosses the instep, passes under the sole (surmounting the posterior part of the splint), and goes up the inner side of the leg as high as the other part of the splint. A bandage holds both sections of this posterolateral plaster mold, and the anterior half is removed daily or less often for massage. The outer portion of the leg is free for inspection and circulation.

Passive motion of the ankle begins within the first week, active motion about the tenth day, the ankle being held during the early phases of this part of treatment. In no fracture is early mobilization so important, otherwise organized exudate from associated synovitis, arthritis and myotenosynovitis will produce stiffness despite accurate bony readjustment. The lateral half of the splint can be removed as soon as union is relatively firm and when active ankle motion causes no reaction. This is ordinarily at the end of a fortnight, and thereafter the posterior part of the splint is gradually shortened so that it is all off by the end of the fourth week. Adhesive strapping or a linen-mesh bandage is then substituted, and

walking on the flat of the foot is allowed when pounding on the heel or firm pressure on the sole is painless. The patient is made to toe-in at first so the eversion is prevented; in some cases building up of the inner side of the sole and heel will aid in this element of treatment.

Cotton, writing on "Treatment of Ankle Fractures," observes that overcorrection is impossible, and that if the foot can be overcorrected the diagnosis is wrong.

As to the treatment of blebs he holds that opening the blebs and an alcohol dressing are the best means of preventing subsequent infection. Splints are uniformly inferior to plaster of Paris, except possibly when both bones are broken above the ankle. The best way of applying plaster is to first wrap the leg in a moderate covering of sheet wadding, then put on the plaster bandages, not tightly, but rolled on.

The important thing is that after the plaster is on, before it sets, the reduction which has been found effective in this case is again carried out, and pressure kept up with the hands in the proper places so as to maintain reduction, until the plaster becomes sufficiently hard to hold the foot in position.

Right-angled dorsal flexion is always maintained if possible. The cast should be left on for from three to six weeks.

Estes writing on "Pott's Fracture of the Fibula, or Fracture-Dislocation at the Ankle," states that reduction is accomplished under complete anesthesia. As for splints, Estes prefers in place of rigid splints of boards or metal, plaster of Paris with strips of flexible wood worked in so as to meet the requirements of each case. It is best to put the foot up in a slightly inverted, slightly adducted position for the first week; then remove the dressing, massage the foot, ankle-joint and lower leg, and reapply a molded splint with the foot in its normal position. Right-angled dorsal flexion is always maintained. If possible the cast should be left on for from three to six weeks. Estes states it is rare to have a perfect restitution of function, and that in rheumatic and gouty subjects this injury is likely to be followed by intermittent pain.

Immunity in Surgery.

Under this title ARMSTRONG (*Surgery, Gynecology and Obstetrics*, May, 1921) defines immunity as the sum total of all interactive processes which proceed in an organism when resisting invasion. Protective immunity is, therefore, only a relative phenomenon, although in the gradual evolution of the species it assumes a growing importance, because only those organisms survive which are endowed with so-called protective reactions, that is, are enabled through manifold endowment to adapt themselves to changing requirements of environment. It is important to remain conscious of this broader conception of immunity, for it places it entirely within the sphere of general biological laws and cell responses irrespective of their desirable or undesirable individual results.

The ideas of Ehrlich, which, as we all know, held the whole field for a time, were entirely chemical. He regarded the toxin of bacteria as a definite chemical compound which was neutralized, like an acid by an alkali, or by another chemical compound, the antitoxin, manufactured by the body cells. But we are to-day very far from regarding this as so simple a process. On the contrary we have learned that the toxin-antitoxin reactions are extremely complicated colloidal phenomena and that toxins and antitoxins are themselves so complex that their chemical entity is quite uncertain. It appears that toxins and antitoxins are very large colloidal combinations, not simple chemical compounds. They are not actually dissolved in the blood, like crystalloids, but rather suspended or emulsified. They unite by selective absorption, and not by simple chemical reactions.

When we have suspended in a medium a number of non-miscible substances (as for instance, colloids in the blood) the surfaces of these substances are in a state of surface tension, and work may be done by these surfaces when the tension is able to diminish. At the interfaces of these substances (that is, between them) there is, therefore, a local accumulation of free surface energy, and this can be reduced by the deposit of

substances with low surface tension at the interface. Consequently, according to a law formulated by Gibbs and Thompson, it follows that substances which lower surface tension will be concentrated and then precipitated on the surface and the energy will be lessened thereby. Thus colloidal complexes adhere to each other in relation to surface energy. This is, therefore, a physical and not a chemical union, and adsorption is distinct from absorption, in which one substance unites with another to lose its identity. Absorption of some colloidal constituents may follow, but this is a secondary matter incidental to adsorption.

Inasmuch as adsorption in colloids is not, at least not essentially, a chemical reaction, but a physical union, dependent, as we have seen, upon phenomena of surface tension and surface energy only, it possesses a different biological significance from chemical reactions of two compounds. Thus, toxin-antitoxin union is rather a group phenomenon dependent upon physical characters, as contrasted with specific reactions of two substances. It follows, therefore, that immunity reactions are not absolutely but only relatively specific. This has been clearly established in the Wassermann reaction, and probably also explains the successful cures of certain diseases, like rheumatic arthritis, by non-specific, say typhoid, vaccines. We know that the fixation of the complement in the Wassermann reaction may not only be accomplished by syphilitic serum (that is, the so-called syphilitic antibody), but by other colloids (crystals and proteins) of similar physical character. These may occur in the blood after meals, after resorption of extensive inflammatory exudates, in acidosis, and in some other lesions. The opposite has also been established, for withdrawal or solution of these colloids from the blood, as, for instance, through ether narcosis, may render even a syphilitic serum incapable of entering into a positive Wassermann reaction, and thus the reaction may be absent in the blood, but still persist in the cerebrospinal fluid. We must, in order to employ this reaction for the diagnosis of syphilis, guard against the

entrance of fat and foreign proteids into the blood which will simulate the syphilitic antibody, and we must also interpret the absence of the reaction *cum grano salis* and as influenced by individual circumstances of a case.

Two other important immunity reactions have recently acquired explanation and significance—chemiotaxis and phagocytosis.

It will be remembered that these, especially phagocytosis, played an essential rôle in the theories of immunity of Metchnikoff. He went so far as to believe that the ingestion and annihilation of bacteria by cells (phagocytosis) was the principal method of cell defense, and the researches of Wright and his pupils led them to believe that differences in phagocytic action depend upon the presence or absence of specific substances, opsonins, which prepared foreign particles for ingestion by phagocytosis; hence the importance of the so-called opsonic index in the blood as index of immunity.

Our ideas have here also undergone decided changes since we know that movement of and ingestion by cells are essential surface tension phenomena. Cells suspended in a medium behave as do drops of colloids, and their movements and ingestion of foreign particles depend not upon chemical affinity, but physical changes in their environment.

A drop of colloid suspended in a non-miscible or only very gradually miscible medium flows gradually toward an area of lessened surface tension in exactly the manner of a cell (ameboid motion). Movement of cells toward an object is, therefore, the result of lowering of the surrounding tension in that direction; movement away from an object, of increase of surface tension at one of the peripheral points. The cell rests when surface tension is everywhere equal. Positive chemiotaxis (movement to) (leucocytosis, cell exudate) is, therefore, identical with lessened tension in one direction; negative chemiotaxis (movement away) (leukopenia) with increased tension in a direction.

The important observations of Rhumbler

have further demonstrated that ingestion of foreign particles is essentially also a surface phenomenon. We can duplicate the same phagocytic action which we observe in the ameba in a drop of chloroform suspended in dilute alcohol, provided we offer to the chloroform a substance like shellac, which is soluble in, or "palatable to," it. Solid particles, like splinters of glass and wood, are rejected by the chloroform as by an ameba or leucocyte.

The point of practical importance is that, as our knowledge advances, the many theories which have been introduced to explain individual immunity reactions give way to applications of general physiochemical laws in conformity with other phenomena of cell life.

High Tracheotomy and Other Errors the Chief Causes of Chronic Laryngeal Stenosis.

JACKSON (*Surgery, Gynecology and Obstetrics*, May, 1921) thus summarizes his excellent article:

The most frequent cause of chronic laryngeal stenosis is high tracheotomy.

While in a given case no one has any right to say that the operation that saved that patient's life was an unjustifiable one, yet, equally rapid methods being available, high tracheotomy should not be taught.

The classic distinction between a high and a low tracheotomy with reference to the isthmus of the thyroid gland is a relic of the days when too much respect was had for the thyroid gland, or at least for its isthmus, and the distinction should be abandoned. The vitally important matter of where the trachea should be incised should not depend upon the negligible isthmus. There should be taught only one tracheotomy, and that should be low.

The trachea should always be incised lower than the first ring except in those rare cases in which laryngoptosis renders this impossible without entering the anterior mediastinum.

The cricoid cartilage should never be cut unless laryngoptosis places all the rings of

the trachea below the upper border of the manubrium, which would require entering the mediastinum if the rule were to be followed.

The tracheotomic causes contributing to chronic laryngeal stenosis are:

- (a) High tracheotomy.
- (b) Hasty operation.
- (c) Attempts at general anesthesia.
- (d) Cutting of the cricoid cartilage.
- (e) Hacking the trachea by several incisions instead of one.
- (f) Denuding the tracheal cartilages of perichondrium with resultant necrosis.
- (g) Suturing the wound.
- (h) Prolonged wearing of a cannula that is of improper size, shape, or material, such as rubber or aluminum, or one with a fenestra, or one without a pilot.
- (i) Neglect of proper after-care. The key-note of the after-care should be that it is a plumber's job; the "pipes," natural and instrumental, must at all times be kept clear.

If in an emergency a high incision of the trachea has been made, a cannula should not be worn in it. As soon as the patient's breathing has been resumed a low incision should be made and the cannula should be inserted therein.

Going deeper, the fundamental cause of so many cases of chronic laryngeal stenosis lies in the faulty teaching in the surgical text-books. The eminent surgeons who write text-books would not do a tracheotomy through the larynx to avoid the isthmus of the thyroid gland, or because of haste; but eminent surgeons are not often at hand when emergency tracheotomies are required. These operations are usually postponed until respiration has ceased. If not already stopped the practitioner promptly stops it by attempting to give a general anesthetic.

In conclusion, the author apologizes for the foregoing constructive criticism of the modern surgical text-books that have perpetuated the errors of the ages, and offers as palliation the excuse that his life has been largely spent in combating the chronic laryngeal stenoses that have resulted from errors unconsciously committed in faulty,

though often life-saving, tracheotomy. And if the language seems to any one unnecessarily vigorous, his attention is called to the fact that previous milder statements to the same effect have been ignored, utterly failing to check the steady stream of needlessly created chronic laryngeal stenoses pouring into the clinic. Perhaps, too, the vigor comes as the venting of pent-up thoughts that could be communicated neither to the patient nor even to the respective tracheotomists who had saved the patients' lives. The fault lies not with either of these classes of individuals, but with the surgical text-books of to-day, which perpetuate a faulty teaching.

Acute Intestinal Obstruction.

FINNEY concludes an excellent paper on acute intestinal obstruction as follows in *Surgery, Gynecology and Obstetrics*, May, 1921:

Difficulty may be experienced in making a diagnosis, especially in postoperative cases.

Definite diagnosis is not necessary before operative measures are begun.

Early diagnosis is the most important factor in the whole category. It is better that the operation should be done early than well. Better a poor operation done on a patient in good condition than a good operation done on a patient in poor condition.

One is too largely influenced, perhaps, in delaying operation in the postoperative cases, by the fact (a) that the patient has just gone through a major surgical operation, and both he and the surgeon dislike exceedingly to submit again to that trying ordeal; (b) that so many cases, comparatively, have symptoms strongly suggesting intestinal obstruction, especially after certain forms of abdominal operation, and recover completely after rest, gastric lavage, starvation, enemata, and medical treatment—that the temptation is strong to postpone the operation unduly in the hope that relief may be afforded through these means. Hence often valuable time is lost in this way, and when operation is finally decided upon it is too late.

Reviews

STUDIES IN DEFICIENCY DISEASE. By Robert McCarrison, M.D., D.Sc. Oxford Medical Publications, London and New York, 1921.

Those who are interested in the progress of investigations on vitamins will read with much satisfaction this excellent book. Containing some 270 pages, it is divided into four parts, as follows:

Part I. Introduction—Vitamins — Experiments.

Part II. Factors Influencing the Onset of Deficiency Disease—Symptomatology.

Part III. Pathogenesis of Deficiency Disease.

Part IV. Practical Application.

In all there are 28 chapters with many illustrations, including microphotographs of tissue sections. Further, as evidence of the effort to have the text convey the most

recent view-points, the author has included references up to a month before the forms were locked, March 1, 1921.

In the early part of the book, and, indeed, throughout all the text, the author stresses the fact that the relative degree of the effect of the deficiency of the vitamins is dependent upon the proper, or improper, qualitative and quantitative amounts of proteins, carbohydrates, fats and mineral salts in the diet. Thus, he states, "Vitamins, like other essential constituents of the food, are not to be regarded as independent of the assistance desirable from their associates in the maintenance of nutritional harmony. Each vitamin is but a member of a team, and the team itself but a part of a coördinated whole."

The reader cannot but be impressed by the very careful and thorough manner in which McCarrison planned and carried out his own investigations. Having both the medical and the highly scientific view-points, the writer was able to correlate many of his findings so as to bring out practical clinical suggestions. The conservative and logical manner in which this is done adds only to one's conviction that the vitamins are perhaps, speaking broadly, even more essential than we are inclined to think. Thus to quote from the summary on the section dealing with symptomatology, the author says:

"Recollecting that all these evidences of deficiency disease are influenced in their onset by the variety of factors to which reference has been made in Chapter IV; that their onset is invariably delayed by a lesser degree of avitaminosis and more perfect balance of the food, or hastened by a greater degree of avitaminosis and more imperfect balance of the food; that deficiency of one vitamin is often combined with deficiency of another, with excess of one proximate principle or with deficit of a second, it becomes evident that such permutations and combinations of factors intrinsic to the food and of factors extrinsic to it may occur as will include within their orbit a vast amount of ill-health among human beings at the present day."

The reports of studies of the pathogenesis, which are primarily from McCarrison's own laboratory, are the most extensive and complete that have been carried out. Considerable of this work has already been published in journals, notably the *Indian Journal of Medical Research*, the *British Medical Journal*, and the *Lancet*. Working not only with pigeons and guinea-pigs but with monkeys, it was found that many of the conditions brought about provided "the pathological basis for attaching to food deficiencies a prominent etiological significance in regard to that great mass of ill-defined gastrointestinal disorders and vague ill-health which throngs clinics at the present day, and concerning which we have hitherto known little or nothing."

As McCarrison puts it—"The place of vitamins in the human economy must be

considered in connection with metabolism as a whole, in connection with their relation to the organs of digestion and assimilation and with their relation to the endocrine regulators of metabolic processes." He is firmly of the opinion that many of the gastrointestinal disorders are due to food deficiency, as becomes manifest by the impairment "of the protective resources of the gastrointestinal tract and pathogenic organisms;" of the secretory and digestive functions; of the assimilative power; and of the neuromuscular control of the stomach and bowel. He finds with the vitamin deficiency not only scurvy, beriberi, rickets, which are commonly associated with it, but what is very common, but usually not associated with faulty diet, loss of appetite, perverted appetite, loss in weight, lowering of body temperature, faulty calcium metabolism, cardiovascular depression, anemia, unhealthy skin, endocrine glandular changes, and symptoms due to malnutrition of the nervous system.

It is interesting to note that he was able in his own clinic to regulate many of these conditions in patients by using extracts containing the vitamins. Attention is called to the fact that even though one may have access to vitamin-containing foods, it does not follow necessarily that they eat the adequate amount of food, or assimilate their food properly. These are questions which should always be considered. Further, he suggests that more information should be available as to how to conserve the vitamins in the foods during the processes of preparation and cooking.

Throughout the book, it is evident that the author has accumulated considerable evidence to substantiate his deductions. We may criticize possibly from the standpoint that some of the work in America has not been quoted as freely as it should—particularly the work of Howe on dental conditions. Nevertheless, the literature on vitamins is becoming so voluminous that it is almost unwieldy.

The book should occupy a place in the library of every up-to-date physician.

CLINICAL EXAMINATION OF THE NERVOUS SYSTEM.
By G. H. Monrad-Krohn, M.D., M.R.C.P.,
M.R.C.S., with a foreword by T. Grainger
Stewart, M.D., F.R.C.P. H. K. Lewis Com-
pany, London, 1921. Price 6s.

In the space of 135 small pages, aided by twelve illustrations, the author of this little book gives succinct and definite methods of examining the functional ability of the nervous system in health and disease. The fact that Grainger Stewart has seen fit to write a foreword for it is in itself a strong recommendation. As Stewart points out, it is essential to have a routine method to examine the nervous system, since by this means time is saved and mistakes due to overlooking symptoms and signs are safeguarded. Stewart thinks that there can be no doubt that in the past the tendency to separate neurology from psychiatry has done much to hinder the progress of both of these branches of medicine.

Although the author is a Lecturer on Neurology in Christiania, nevertheless he has written the text in English, so that there is no danger of mistakes on the part of the translator.

It is a handy little manual for students

of neurology which deserves to be cordially received.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume II, June, 1921.

Unavoidable delays in the printing office have prevented the appearance of the June issue of *Progressive Medicine* from coming out until July. This issue, as did those in previous years, deals with the Surgery of the Abdomen, Gynecology, and Disorders of Nutrition and Metabolism, Diseases of the Blood and Spleen, and Ophthalmology.

Altogether this volume contains nearly 400 pages. The authors are Dr. Charles of St. Louis, on Diseases of the Eye; Dr. John G. Clark of Philadelphia, on Gynecology; Dr. W. B. Coley of New York, on Hernia; Dr. E. H. Funk of Philadelphia, on Disorders of Nutrition; and Dr. A. O. Wilensky of New York, on The Surgery of the Abdomen.

The volume is freely illustrated and copious references are given to the literature which is quoted.

Correspondence

A New Method in the Treatment of Typhoid and Paratyphoid Fever.

To the Editors of the THERAPEUTIC GAZETTE.

Sirs: On May 21st I was called to see a patient, who proved to be the first of a series of epidemic cases from Lambs Camp, Menzies Bay. Within ten days 13 others were taken ill, and were in hospitals under treatment. Five ambulatory cases were also kept under observation, but did not become seriously ill.

The marked feature of every case was the intense toxemia and the severe nervous symptoms; the first case became very toxic, so that I despaired of her life. At that point I decided on the intravenous introduc-

tion of carbohydrates and alkalis, basing my reasons on the recent work published by Lawrence J. Henderson in *Oxford Loose Leaf Medicine*.

J. L. Miller has truthfully said toxemia is responsible for half the deaths in typhoid. In my patients I chose the time when they showed the signs of severe oncoming toxemia, alarming both to myself and patients' friends, for the beginning of this treatment. In the first three cases the patients were so ill that the relatives were sent for to be present at their expected death. The success of the method in these patients led me to give the treatment slightly earlier in the others.

These patients were given 10 to 12 ounces

of normal saline containing 2 drachms of glucose and thirty grains of soda bicarbonate; the latter was increased in some cases. This intravenous injection was repeated in two cases.

In all my patients a violent reaction took place in 40 to 60 minutes, viz., chills, great perspiration, and bowel movement. These symptoms were combated with the usual remedies, such as hot drinks, increased covering, and hot-water bags. In all the patients there was in six hours a marked fall in temperature, and in 16 hours all temperatures were normal. All those treated, although they had not slept for some nights, even with morphine, enjoyed a refreshing sleep of eight hours' duration. The appetite was also greatly improved even with some who had refused food before treatment. The mental drowsiness and apathy improved at once. The matron and her staff were quick to see the improvement, and within a few hours all patients ceased to be a source of worry to myself or the rest of the staff.

Of six patients treated by the usual methods, four died.

Dr. Walker, of the Provincial Health Office in Victoria, was sent for to investigate, and in company with him I visited the camp. He took back with him samples of water and samples of blood and stools from various infected patients, and reported as follows:

Wicksburg, deceased, stools contained typhoid and paratyphoid bacilli, and blood culture positive.

Miller, stools contained typhoid bacilli only.

Ramsey, stools contained typhoid bacilli only.

Lamb, stools contained typhoid and paratyphoid bacilli.

These results were confirmed by reports from Vancouver General Hospital.

The water examination was negative. All evidence of infection centered on two cooks, who were in the camp a week, about five weeks previously. Efforts are now being made to find these cooks and have them tested.

Thus we see that the preponderating infection was a mixture of para and true typhoid.

Cases are divided as follows:

Case 1.—Mrs. G., aged nineteen; admitted May 22. Temperature 104.4°, pulse 108; complained of great pain over right epigastric region and back, severe headache, weakness and diarrhea. She became very toxic and mentally apathetic, refusing food on May 27. At 3 P.M. an intravenous injection was given. In forty-five minutes there was a severe reaction, chills, perspiration. The usual treatment as outlined above, and strychnine 1/40, pituitary, morphine 1/8 grain, with atropine, were given. At 9:30 P.M. temperature was 99°. On May 28 at 5:30 A.M. temperature was 97 2/3°, pulse 66. In the next three or four days there were slight rises to 100°, and after that uneventful recovery. June 15 she was discharged convalescent. The most striking results in this patient were the immediate clearing of mental apathy, the drop in temperature, and return of appetite the following morning.

Case 2.—Mr. J. L., aged forty-eight; admitted May 25, 8 P.M. Temperature was 100°, pulse 80. Complained of severe pain in right epigastric region and back, headache, diarrhea, weakness, and inability to sleep. The temperature and pulse continued about 100° to 102° until June 3, when his condition suddenly became very toxic and weak and very serious. On June 3 an intravenous injection was given at 3 P.M. and reaction similar to Case 1 occurred. On the following morning the temperature was 98° and he had the first real sleep since arriving at the hospital. He was greatly improved, and recovery was rapid. He sat up June 21, and is still in hospital, convalescent.

Case 3.—C. R., aged thirty-three; admitted May 27, 8 P.M. Temperature 102°, pulse 98. Complained of similar symptoms as Cases 1 and 2, but the nervous symptoms were much more severe. He was unable to sleep even with opiates. On June 4 his relatives were sent for, as I considered his state very serious. An intravenous injection was given at 3 P.M. A slight reaction followed, but considerable improvement was noted. However, the nervous condition was still troublesome, and on June 7 a second intravenous injection was

given. In this the soda bicarbonate was increased to 100 grains, and the glucose to 3 drachms. A reaction, much severer than the first and corresponding to that of the other two cases, followed. The temperature fell on the following morning to 96.2° , pulse 78, and improvement was marked and continuous. He was able to walk on June 21.

Case 4.—J. H., aged thirty-two; admitted May 25. Temperature 102.6° . Symptoms as in other patients. On June 3 and 4 he became very weak and toxic. On June 4 an intravenous injection was given. Immediate improvement occurred. The following morning temperature was 99° , pulse 76. Patient was walking June 17 and was discharged convalescent June 29.

Case 5.—A. M., aged thirty; admitted June 4. Temperature 103° , pulse 100. He complained of the usual symptoms, but showed more prostration. On June 13 an intravenous injection was given. Marked reaction occurred as in other patients. June 15 the temperature was 98.2° , pulse 78. Condition greatly improved and able to sit up in bed; out of danger. On June 29 another injection was given this patient for lingering toxemia, and this hastened improvement.

Case 6.—F. M., aged eighteen; admitted June 6. Temperature 102° , pulse 82. Usual symptoms. June 12 an intravenous injection was given; June 13 temperature 97.4° , pulse 82. Recovery rapid. Now convalescent, and able to walk about. Still in hospital.

Case 7 (not included in series and given for demonstration).—G. W., aged thirty; admitted to Dr. C.'s service May 23. Severely ill up to June 5, when transferred to my service, at 12:30 A.M. Condition very weak, temperature 102° , pulse 100; fecal vomiting present. Unable to retain nourishment. In consultation with Dr. Lamb decided to give 4 ounces of solution, as condition was very weak and it was thought he would not stand much. In a few hours his general condition was greatly improved; vomiting discontinued. At 8 A.M. June 6 temperature was 98° , pulse 94, but he was still vomiting bile. At 10 A.M. 4 ounces of solution were given intravenously. General improvement continued through the day. Some rectal feeding had been given from the evening of June 5, but apparently it did not keep up the patient's strength. He died 2 A.M. June 7, conscious to the end.

It is apparent that the intravenous treatment of typhoid fever has, in the patients enumerated, been a success, and in my opinion, and that of the other physicians and nursing staff, undoubtedly saved the lives of these patients, as shown by the six controls.

The application of intravenous treatment to other types of infectious diseases presents a large field of exploration for the physician who is not satisfied with the old standard treatment.

Further observations are necessary. Reports on other cases will follow.

W. F. SHAW, M.D., M.R.C.P. (London).
CAMPBELL RIVER, B. C.



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Original Articles

The Treatment of Bronchial Asthma¹

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The treatment of bronchial asthma is one of the most perplexing problems which confronts the general practitioner. In the past our inadequate conception of the etiology and pathology of the disease made our therapeutic measures rest upon an empiric rather than a scientific basis. To-day the recognition of the importance of protein sensitization as a factor in at least one-half of the cases has led to a more rational treatment than has heretofore been possible. In most patients there are many factors operative in the etiology, and the success in treatment is proportional to the uncovering and correction of these multiple factors. Before discussing treatment, therefore, let us consider briefly our modern conception of the pathology and etiology of the disease.

The pathologic changes in the bronchi and lungs are neither constant nor characteristic. In cases of long standing, emphysema is frequently found. Pathologic changes in the bronchi, however, are uncommon in spite of the long duration in some instances of the disease. Thus Kamchorn and Ellis's (*American Journal*

of the Medical Sciences, 1921, clxi, 525) patient had asthmatic attacks increasing in frequency from childhood to the age of fifty-two, when he died during an attack, and yet the bronchial tubes showed no greater histologic changes than might develop in a few days during an acute inflammation without asthma. Ellis (*American Journal of the Medical Sciences*, 1908, cxxxvi, 407, and 1921, clxi, 525) concludes from data from ten necropsies following death during an attack that nothing in the histology of the bronchi explains the course of bronchial asthma. Ellis's studies would seem to lend weight indirectly to the theory of spasm of the bronchial muscles, which now seems to be fairly generally accepted.

Of interest as bearing upon the etiology as well as the pathology of the disease, is the case reported by Boughton (*Journal American Medical Association*, 1919, lxxiii, 1912) in which sudden death occurred following the injection of one minim of horse serum used as a desensitizing agent. The subject was an otherwise healthy man who had suffered from asthma for about twelve years whenever he came in contact with horses. The effect of the injection of that minute quantity of serum was a typical at-

¹From the Department of Medicine, Jefferson Medical College. Read before the Lancaster County Medical Society, July 6, 1921.

tack of bronchial asthma which terminated fatally in forty-five minutes. The microscopic examination of the lungs showed slight, questionable catarrhal bronchitis and emphysema. The lesions as found in Boughton's patient are not unlike those quite constantly found in animals dying from anaphylactic shock. In fact the clinical manifestations of bronchial asthma are not unlike the anaphylactic phenomena observed in animals. It is upon this basis that we have constructed largely our modern conception of the disease. Certain cases, such as Boughton's, come definitely within the category of anaphylactic phenomena. In others the relationship, though oftentimes assumed, is less clear. In some the anaphylactic factor is subordinate to other factors whose causative relation is evident by the disappearance of the asthma with their removal—*e.g.*, the cessation of asthma after the removal of a nasal polyp, etc., etc. For the present moment let us consider bronchial asthma from the viewpoint of an anaphylactic phenomenon.

In anaphylaxis the following phenomena occur in the experimental animal. When a foreign protein (animal, vegetable, or bacterial) is introduced into the body (beneath the skin, in the serous cavities, in a blood-vessel, and in some cases of feeding), there appears after a definite interval a marked susceptibility to a second introduction of the same protein. It is thus a specific reaction. The second injection, which otherwise would have been harmless, produces violent symptoms of illness and often death. The reaction studied in guinea-pigs reveals restlessness, sneezing, cough, dyspnea, frequent urination, etc. The chest wall seems immobilized. Later shallow, irregular, spasmodic efforts take place. This, as Auer and Lewis have shown, is due to spasm of the smaller bronchioles with more or less imprisonment of the air in the lungs. An acute emphysema of the lungs is produced. If death occurs it is largely respiratory, the heart continuing to beat after respiration has stopped. If the animal survives it is desensitized for a time, but the desensitization is transitory — usually

about three weeks in the guinea-pig (Otto). The modern tendency is to consider asthma basically as an anaphylactic phenomenon. Sensitiveness to a given protein or group of proteins may disappear, due to transitory antianaphylaxis. The paroxysms may disappear because of the removal of the inoculable protein. In most cases of asthma the individual is sensitive to a number of proteins. In other words, multiple sensitization, rather than sensitization to a single protein substance, is the rule. In one-half of the cases it is possible to demonstrate the sensitiveness. In the remainder sensitiveness may be present, but cannot be demonstrated. In a few it is distinctly subordinate to other factors which will be dealt with in discussing treatment.

The proteins to which a patient may be sensitive belong in five groups: (1) Pollens; (2) foods; (3) animal hairs and dandruff; (4) bacterial; and (5) dust. These proteins enter the body by absorption from the respiratory mucous membrane (inhalation) and through the gastrointestinal tract (ingestion), through the skin (inoculation), or by infection anywhere in the body, but especially about the mouth, upper respiratory tract, and lungs. Inhalation is the method by which sensitization occurs in the instances of pollens, animal emanations and hairs, and various kinds of dust.

Treatment of the Asthmatic.—The management of the asthmatic patient varies somewhat as to whether we see him during an attack or in the interval. The measures used during the attack are directed toward relieving the bronchostenosis. The measures between the attacks are directed toward discovering the exciting factor operating in precipitating the paroxysm. Briefly, the measures used for the former are epinephrine, atropine, morphine, amyl nitrite, nitroglycerin, and inhalations of chloroform. Calcium lactate in 10-grain doses every four hours may be useful in allaying nervous excitability. The prompt administration of an active saline cathartic, such as Epsom salts, is frequently neglected, though most important. Of all the various remedies useful in an acute attack epi-

nephrine by hypodermic injection gives the most striking results "when it works." In the writers' experience small doses (*e.g.*, 5 to 10 minims of a 1:1000 solution) are just as effective as large doses, and more than one dose is of little avail if the first fails. The action of epinephrine is probably by stimulation of bronchodilator (sympathetic) nerve endings. Park in 1912 showed that when this drug was applied to the excised rings of the bronchi of the ox, even in concentration as low as 1 to 10 million, relaxation occurs without primary constriction. As Bastedo points out, the rule that a drug acts best when the condition opposing it is extreme makes it peculiarly valuable in bronchial asthma. The effect upon the bronchi is out of proportion to the effect elsewhere, and is often evident even when the degree of arterial pressure is not affected in a measurable degree.

When epinephrine fails morphine and atropine are our most serviceable remedies. Atropine acts as an antispasmodic in a different way from epinephrine. It depresses the peripheral sympathetic (vagus) nerves in the lungs. In the same way the other members of the solanaceæ—stramonium and hyoscyamus—lobelia and amyl nitrite may be useful. Recently benzyl benzoate has attracted considerable attention as a result of the work of Macht (*Southern Medical Journal*, 1919, ii, 367). In an analysis of 150 cases of asthma he found that the benzyl benzoate treatment was beneficial in 75 per cent. In some the results were very striking and were equaled only by those obtained through the injections of epinephrine. In some cases benefit was obtained when epinephrine, the opiates, and other remedies failed. The cases treated were both adults and children, and in the latter the results were oftentimes most striking. In our experience the drug has been found useful, but must be given in larger doses than commonly advised. In an adult one or two teaspoonfuls of the 20-per-cent solution every three or four hours for some days may be necessary.

Many other drugs have been advised in

the therapy of bronchial asthma; most of them have been discarded excepting one, which is frequently used empirically and with some success—potassium iodide. Given over a considerable period of time it seems to reduce the frequency and severity of attacks.

Sometimes during an attack, certainly after the severe paroxysm has subsided, the physician should endeavor to ascertain the causative factors in the production of the attacks. Is the case one which is due to hypersensitiveness to a foreign protein? What collateral factors are present and what bearing have they on the asthma? In the effort to answer the first we inquire as follows:

1. *The age when the asthma began.* The younger the patient when the asthma began, the more likely the factor of protein sensitization. An onset before five years renders protein sensitiveness a most likely factor. Ninety per cent is about the frequency of protein sensitization in asthmatics whose attacks began in early childhood. An onset after forty years usually means that there is some factor other than protein sensitiveness as a cause. After forty great care must be exercised not to confuse with true asthma the dyspneas of other cause such as cardiac and renal disease, emphysema, etc.

Bacteria are frequently a cause later in life, and focal infection must be investigated.

2. *The time of occurrence of the attack.* If the attacks are seasonal there is probably a pollen sensitization. These patients often give a history of associated pollen rhinitis. Later, with the development of multiple sensitization, *e.g.*, pollens plus bacteria, etc., the seasonal character may be replaced by all-year asthma. Again, the asthma following acute bronchitis may simulate the seasonal incidence of the pollen types due to the frequency of acute respiratory infections at certain times of the year, *e.g.*, the spring and fall. In this group the history is that of recurring colds or an acute bronchitis which is associated with or followed by asthma. Bacteria are

among the causative factors in these cases. The sputum should be carefully studied. Nocturnal asthma, only, may be due to sleeping on a feather pillow, or as in one of our cases, to "cat hair," the patient being asthmatic at night when a cat slept in the same bed, but free during the day while at work.

3. *Environment, occupation, habits, association with animals.* Dust undoubtedly plays an important part in the etiology of asthma. Inquiry should be made in regard to the presence and character of the dust in any given occupation. Why one individual should become sensitive to the dust and another not is difficult to explain. We have seen asthma in a textile worker disappear after change of occupation. Likewise asthma disappeared with change of occupation in a pillow-maker who was sensitive to goose feathers. Bakers have asthma from flour dust; polishers from wood and other dusts. Domestic animals, *e.g.*, horses, rabbits, etc., may be the cause of human sensitization to the hair proteins. Hostlers and draymen get asthma from contact with horses. One physician had to give up laboratory work because he was sensitive to the emanations from laboratory animals. Other dust contacts occur in the sleeping on feather pillows, use of woolen blankets, wearing of furs, use of face powders, etc., etc.

4. *The dietary habits of patients.* An inquiry into the relationship of the asthmatic attacks to the ingestion of food is particularly necessary in those patients whose asthma began in early life. Some of these patients will not be aware of any relationship, but many learn that certain foods are directly causative of the asthmatic attack; or are not tolerated because of other manifestations, such as vomiting, diarrhea, or dermatitis. We have been struck with the frequency of the history of eczema in early life in those patients with food asthma later in life. The foods, in the order of their etiologic importance, are the cereals, principally wheat, eggs, potatoes, and sea food. Milk and the meats are at the end of the list and less provocative

than generally supposed. In not a few cases some unsuspected article, such as mustard, pepper, banana, strawberries, nuts, coffee, etc., may be the etiologic factor.

5. *Foci of infection.* In every asthmatic patient search should be made for foci of infection—chronic rhinitis, sinusitis, diseased tonsils, abscessed teeth, gastrointestinal infection, etc., etc. The eradication of these foci with the use of an autogenous vaccine is of vital importance in the treatment of the asthmatic.

6. *Skin tests.* To aid in the determination of the causative proteins small cuts $\frac{1}{8}$ to $\frac{1}{4}$ inch long are made on the flexor surface of the forearm with a sharp scalpel, not deep enough to draw blood and yet deep enough to penetrate the skin. The pollen, food, animal hair and bacterial proteins to be used are placed upon the cut, and if in powdered form dissolved in a drop of a decinormal potassium hydrate solution. A positive skin test occurs within fifteen minutes to one-half hour, and consists of an urticarial wheal surrounding the cut with a large or small zone of redness beyond the elevation. There may be some tingling or itching. These reactions are specific. The skin tests are most easily performed and most reliable with the pollens and animal hair proteins, less so with the foods, and least with the bacteria. In fact we have discarded skin testing for bacterial protein sensitiveness. We have had no experience with the intradermic method of testing. We can see no advantage over the technique as given.

Now, having determined the protein sensitiveness in a given case, our treatment is as follows:

1. If a pollen, desensitize preferably in advance of the pollen season with increasing doses of the pollen dilution, beginning with a dose which produces no reaction. Ten or twelve injections at five- or seven-day intervals constitute a course of treatment. Removal from the pollen environment is desirable. If the patient reacts to a number of pollens, select the one giving the most marked reaction for the desensitizing treatment. *It is inadvisable to use multiple pol-*

len injections, which resemble the old shotgun prescriptions.

2. If a food, remove the food from the diet. Desensitization is not often practical. It works in some case, *e.g.*, eggs, especially in younger patients.

3. If animal hair, remove the source of the protein. It may be necessary to get rid of the dog or cat, change the occupation, stop riding horseback, change the feather pillow to a floss pillow, stop wearing furs, etc., etc. It is possible to desensitize as in the case of the pollens and by a similar method.

4. If a bacterial protein sensitization, remove the focus of infection and use an autogenous vaccine.

5. If a dust contact, remove from dusty environment. (See previous paragraph.)

Vaccine treatment is indicated in most cases of asthma. In those instances in which sensitization seems to be primarily bacterial, its use is attended by the largest percentage of good results. In this group Walker (*Archives Internal Medicine*, 1919, xxiii, 220) obtained relief in 75 per cent and improvement in 21 per cent. Among other sensitive groups, *e.g.*, the pollens, animal emanations, foods, etc., there is a frequent benefit from the use of vaccines because of superimposed bacterial infection, which, if it does not produce sensitization of itself, prolongs or precipitates attacks by reason of the local and general changes which such infection induces. In the non-sensitive group the vaccines are less valuable. They are a distinct help, however—to wit, 40 per cent relieved and 20 per cent improved in the patients studied by Walker. An autogenous vaccine made from the sputum, or from an infected tooth, nasal sinus, etc., is preferable to a stock vaccine. The permanency of relief from vaccines depends upon the type of case in which they are used. In the straight bacterial cases it may be for a number of months. Second and third courses of vaccine therapy may at times be indicated, and our experience has coincided with that of Walker in that such secondary courses may be of more benefit than the first. In several instances

under observation an almost constant vaccine therapy seems necessary to keep the patients free from asthma.

Among asthmatics the physician finds not infrequently a "neurotic background," if one may use such a term. If there is not a family tendency to asthma, or hay-fever, or urticaria, etc., significant of an inherited tendency to protein sensitization, there may be a neurotic history, *e.g.*, of epilepsy, migraine, and nervous or mental disease. A period of rest in bed with attention to the diet, or a regulation of the rest and exercise, etc., is of prime importance in those with subnormal nervous reserve—the neurotic group.

Just how far such an underlying neurotic state can go beyond predisposing to asthma is difficult to state, and yet it is recorded that asthmatic paroxysms have been provoked in such individuals by the smelling of an artificial rose, or by the occurrence of fright, menses, etc. The older writers were fond of speaking of asthma as a reflex neurosis, and quote its disappearance after the removal of nasal polypi, impacted teeth, etc. It is more likely that by these operations foci of infection were removed, thereby benefiting the patients. This we believe to be the real explanation of improvement and recovery following nasal operations generally. There can be no doubt that the presence of renal or cardiac disease may precipitate or aggravate the asthmatic attack in a victim of the two conditions. Certainly the correction of cardiac and renal defects, in so far as that is possible, is indicated in every asthmatic.

A point of considerable importance is the care of the gastrointestinal tract. A simple, easily digestible diet with attention to the emptying of the bowel is necessary in all cases. Dietetic errors, constipation, flatulency, etc., all predispose to asthmatic attacks. This relationship caused the older writers to speak of gastric, dyspeptic, or intestinal asthma.

In conclusion, we wish to emphasize that the successful treatment of asthma is possible in a fairly large percentage of cases

if the time is given to what amounts to a rather exhaustive study of the history, symptoms, and physical condition of the patient, not only during the paroxysm but in the interval between the attacks. Some of the failure to treat asthma successfully has been because of incorrect diagnosis. In our clinic at the Jefferson Chest Hospital

we have come across a number of patients referred as asthmatics who have been found to be instances of cardiac disease, renal disease, foreign body in the bronchus, fibroid tuberculosis, emphysema and chronic bronchitis, thymic enlargement, intrathoracic goitre, mediastinal tumor, tumor of the lung, aneurism, etc., etc.

Basal Metabolism—Its Application to Internal Medicine

BY HENRY K. MOHLER, M.D.

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Metabolism as defined by DuBois¹ "includes the absorption of foods, their oxidation and transformation into body constituents, and also the later oxidation of these tissues. Such are the energy exchanges of the body tissues taking place with the consumption of oxygen and the formation of carbon dioxide, these gases being carried to and from the blood by means of the respiratory apparatus."

It is very obvious, then, that the rate of metabolism must vary greatly, depending upon the character and amount of food ingested and upon exercise and the many activities of the body.

The idea that a number of diseases are due to disorders of metabolism or have, as part of their symptom-complex, evidences of disturbances of the normal metabolic rate is not by any means a new one. In order that the rate of metabolism shall be expressed in terms that may be used as a means of comparison of one individual with another, or the rate of the same individual under different conditions, it is necessary to determine the rate of metabolism under certain definite conditions. To meet the requirements the minimum heat production of the body is estimated fourteen or more hours after taking

food (in the postabsorptive period) with the subject in the state of complete physical and mental rest. The result thus obtained is termed the basal metabolism rate.

The basal metabolism rate may be determined by one of two methods, the older, direct calorimetry, and the more recent, indirect calorimetry. The former method requires expensive, complicated apparatus, considerable experience and training, is time-consuming in making the determination, thereby confining this method to research laboratories. The complexity of the method prevents its liberal use in studying metabolism in groups of patients. The results, however, are more accurate than by those obtained by the indirect calorimeter. The research laboratory has made an important contribution to the clinical laboratory by making the indirect calorimeter practicable.

The indirect methods of estimating basal metabolic rates have become very popular, largely on account of the simple types of apparatus which have been devised, and have thus overcome the objection made to the extensive use of the direct method.

Regarding the results obtained by estimating basal metabolism by direct or indirect calorimetry, experiments made by workers indicate so little variation that the error which is common to all by the indirect method is negligible.

¹The Basal Energy Requirement of Man. By Dr. Eugene F. DuBois, in the *Journal of the Washington Academy of Sciences*, June 4, 1916.

Indirect calorimetry, to which we shall limit this discussion entirely, is the determination of the heat production by ascertaining the amount of oxygen utilized and the quantity of carbon dioxide and nitrogen eliminated. As stated in the definition of basal metabolism rate, this determination must be made in the postabsorptive period with complete mental and physical rest.

Recent observation showed that there is less danger of error in computing heat production from the oxygen consumption alone, thereby further simplifying the procedure.

From the amount of oxygen consumed in a given unit of time, usually a ten or fifteen minute period, is estimated the number of calories of heat produced per square meter of body surface. The surface area of each subject studied can be determined readily according to DuBois's chart, having ascertained the actual height and weight. All known methods of estimating body surface are open to criticism, and Means and Woodwell¹ in their investigation are not able to find any other method that appears to possess material advantage over DuBois's method. This result is further corrected for temperature and barometric pressure changes and reduced to the amount of oxygen consumed in periods of one minute.

DuBois has determined the basal metabolism rate in a large number of normal individuals of both sexes and of different ages. His studies have furnished standard rates for comparison. These normal rates compared with those obtained from subjects studied, if increased or decreased, are expressed in terms of percentage of the normal. Thus a 25-per-cent increase would be termed basal metabolic rate of +25, and 25-per-cent decrease would be termed a basal metabolic rate of -25.

Since it has been shown that normal individuals vary within a range of 15 per cent either above or below normal figures given by DuBois, only values above +15 or below -15 are considered abnormal.

A number of kinds of apparatus are now

available, and no attempt will be made to cover the technique or to supply descriptions of the different types. Emphasis is laid upon a thorough understanding of fundamentals of metabolism, selecting the proper time and conditions under which the metabolism test is to be performed and the importance of checking up the results obtained. With these precautions observed the author, whose experience has been limited to the Sanborn Benedict portable apparatus, is convinced of the practical value of the determination of the basal metabolism rate as an aid in the investigation, diagnosis, treatment, and prognosis of an important group of diseases.

All the results obtained must be considered under the following conditions:

1. The tendency often is to attach too great importance to a laboratory finding to the exclusion of a careful investigation into the patient's history and symptoms, and failure to make a careful physical examination. The laboratory evidence is considered a diagnosis, when it is but a report of the result obtained from a single procedure. No laboratory finding is to be considered except with all other evidence that can be secured. The basal metabolism estimation is a laboratory report.

2. That the rate of basal metabolism has been made by a competent worker, familiar with disease (preferably a medical man), and one fully informed as to the proper conditions under which the test should or should not be made. The observer must further thoroughly understand the use of the apparatus.

3. That, if possible, before a report is rendered at least three observations be made, preferably on successive days. If the conditions are practically the same there will be but slight variation in the findings.

The development of the simple types of apparatus, which requires on the average about one hour of time to make a determination of the rate of basal metabolism, has stimulated a large number of clinicians to enter the field of basal metabolism study. As more workers become engaged in the work additional avenues of investigation.

¹*Archives of Internal Medicine*, vol. 27, No. 5, page 619.

will be opened, and the value of these observations be increased in number and in usefulness.

Of what value may be the determination of the basal metabolism rate in the light of our present information?

1. As an aid in the recognition of diseases which have increased or decreased metabolic rates, and to aid in the differential diagnosis of conditions which resemble diseases that have abnormal metabolic rates from those with normal metabolic rates.

2. As a guide to medical, surgical, x-ray, and radium treatments, and to determine their effectiveness.

The determination of the basal metabolic rate finds its widest field of usefulness today in the study and treatment of disturbances of the thyroid gland. Frederick Müller in 1893 recognized that there was increased protein destruction in overactive thyroid glands and consequently an increased metabolic rate. Since that time numerous investigations have been conducted along avenues opened by Müller. When the thyroid gland is overactive an increased basal metabolic rate is present, and underactivity of the thyroid gland results in a decreased rate.

The estimation of the rate of basal metabolism under the following conditions is most important in their diagnosis and treatment:

1. Enlarged thyroid gland with symptoms of hyperthyroidism.

2. Enlarged thyroid gland without symptoms.

3. Enlarged thyroid gland with symptoms resembling those present in hyperthyroidism but due to causes other than hyperthyroidism.

4. No apparent enlargement of the thyroid with other symptoms of hyperthyroidism.

5. Enlargement due to tumors of the thyroid gland in which there is either no change or an increase or decrease in the activity of the thyroid gland.

6. Enlarged thyroid gland with symptoms of hypoaactivity of the thyroid gland.

7. No apparent change in the size of the thyroid gland with symptoms of hypothyroidism.

The determination of the basal metabolic rate should be made in every case of goitre with impaired health with the view of determining if the illness is dependent upon the goitre or whether due to other causes. Unquestionably there are individuals in ill health, with or without enlargement of the thyroid gland, with other symptoms commonly found in hyperthyroidism whose recognition is difficult in the absence of the estimation of the basal metabolic rate.

The interference with so vital an organ as the thyroid gland especially by surgical procedure has resulted in hypothyroidism having been added to the disease actually responsible for the symptoms attributed to disordered action of the thyroid gland. To this group belongs the large number of cases of so-called disordered action of the heart seen in soldiers during the recent war, patients suffering from neurocirculatory asthenia, nervousness, weakness, loss in weight, incipient tuberculosis, syphilis, and gastrointestinal disturbances. These conditions are rendered more difficult to diagnose if a functional enlargement of the thyroid gland is present. The determination of the basal metabolic rate is of the greatest help in ruling out thyroid gland etiology and assisting therefore in directing the proper course of treatment.

A large number of the thyroid gland enlargements, especially in young women, in women during menstrual period or during pregnancy, which are functional in character cause considerable anxiety and worry to the individual. A basal metabolism determination may be of the greatest value, allaying unnecessary fears by finding a normal basal metabolic rate. In the absence of the knowledge of the basal metabolism rate, normal thyroid glands have been removed and hypothyroidism has resulted.

In tumors of the thyroid gland the nature of the growth may be such as to destroy the gland tissue and produce a condition of hyperthyroidism, or on the other hand

stimulate the thyroid to increased activity. Some tumors produce no variation in the basal metabolic rate.

There is also another group of individuals who present all or some of the symptoms of hyperthyroidism or hypothyroidism, but in which the thyroid gland is not palpable. The estimation of the basal metabolic rate under these conditions reveals the actual activity of the gland.

Enlargement of the gland may accompany hypothyroidism, and under such conditions the determination of the basal metabolic rate will be of the greatest help in prescribing the proper course of treatment.

In all suspected cases of underactivity of the gland in which but few or only a single symptom of hypothyroidism may be present, the determination of the basal metabolic rate may throw light on the underlying condition.

In exophthalmic goitre the determination of basal metabolic rate is of help in deciding upon the kind of treatment, the frequency of treatment, and the result of treatment, the justification and safety of surgical procedures, the severity of the intoxication, and the prognosis.

In polyglandular disturbances the estimation of the basal metabolic rate may be of the greatest help, especially in determining that other glands than the thyroid are largely at fault.

One can conceive that in many diseased conditions there are present phenomena which of themselves will increase the basal metabolic rate—for example, chills, sweats, fever, dyspnea, exercise, food, emotion, apprehension, anger, fright, tremor, menstruation—and these in themselves may account for variations of basal metabolic rate.

In thyroid disease one cannot but be con-

vinced that the determination of the basal metabolic rate has been a distinct step forward in the assistance it gives in the direct diagnosis of diseases of the thyroid gland and in the differential of conditions resembling it and of the effectiveness of treatment and the prognosis. Certainly this procedure is entitled to take its proper place among the valuable laboratory tests. The problems associated with the large group of diseases of the thyroid are far from solution, but if any progress has been made recently it has come from the increased interest which basal metabolism estimation has stimulated.

The following is a list of the range of metabolic rates found in various diseased conditions:

BASAL METABOLISM AS REPORTED IN VARIOUS DISEASES.¹

Per cent basal metabolism above or below average normal.		
Normal	-15	to +15
Obesity	-14	to +10
Diabetes mellitus:		
Severe	-19	to +33
After fasting	-36	(lowest observed)
Emaciated	-87	to -10
Cardiorenal without dyspnea	-10	to +10
Cardiorenal with dyspnea	+25	to +50
Nephritis with edema	-40	to +14
Nephritis without edema	+2	to +29
Pernicious anemia	+2	to +23
Leukemia	+21	to +123
Typhoid fever		as high as +50
Tuberculosis (temperature about 104° F.)	+15	to +25
Tuberculosis (no fever)	-23	to +15
Prolonged undernutrition	-30	to -10
Exophthalmic goitre:		
Very mild	+15	to +30
Mild	+30	to +50
Severe	+50	to +75
Very severe		over +75
Cretinism and myxedema	-40	to -15

These figures have been taken largely from the publication of E. F. Dubois and his collaborators, though other sources have been consulted.

There is no end to the additional information which may come to us by the further and continued study of the basal metabolism of these and other diseases.

¹The Medical Clinics of North America, 1921, vol. 4, No. 5.



Wiring and Electrolysis for Aortic Aneurism

BY JOSEPH SAILER, M.D.

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In Volume II of Oxford Medicine, McKenzie and Girdwood in their article on Aneurism state that a great many expedients have been used to facilitate the formation of the clot for influencing the course of the disease. It is doubtful if any of these are of value. Osler in the eighth edition of his text-book gives a brief paragraph upon the results of the introduction of foreign bodies into the sac of an aneurism. He speaks of the danger of the operation and the difficulty of determining whether the aneurism is saccular or not. He does not comment excepting to mention that some of the cases are successful.

Occasionally reports appear in the journals of aneurisms that have been wired, but they are scanty and often contain an apologetic note; this in spite of the fact that Dr. H. A. Hare of this city has wired thirty-five cases without a single accident and with almost uniformly good results, and I can add to this sixteen cases that I have personally wired without a single accident, and with no deaths and several excellent results—at least no deaths as a result of wiring, although some of these patients must subsequently have died. As my patients have, as a rule, been hospital cases, in nearly all instances they have disappeared, and no subsequent information could be obtained.

One patient was seen six months after the wiring pushing a heavy huckster wagon on Delaware Avenue. He was interviewed and reported that he felt well and strong. He had had a saccular aneurism extending to the right from the transverse portion of the aorta.

Still another case has been kept under observation due to his rather frequent admissions to the alcoholic ward of the Philadelphia Hospital. Nine years ago a subclavian aneurism was wired. As the pulsation persisted, one year later it was wired

a second time. When seen recently there was very faint pulsation in the sac. The man has done more or less laboring work and lived, apparently, a dissipated life.

In this paper I shall report the history of a case that it has been possible to follow for a period of three years. It seems justifiable to place it upon record for the reason that at the time the operation was undertaken it was generally conceded that the patient could live but a few days, an opinion which may have been mistaken, but was shared by all who examined him. Improvement began immediately and continued progressively up to the present time, so that the patient is now and has been for more than two years actively engaged in an arduous and important business.

To begin therefore with the conclusions instead of placing them at the end, it may be confidently asserted that in this particular instance the risk involved in wiring the aneurism was justified, the results exceeded our expectations, and the treatment deserves much more consideration than has hitherto been accorded to it.

At the time of the operation the patient was forty-four years of age. The family history was unimportant excepting that his wife had had three miscarriages and no living children. He had had typhoid at twenty-two years, some dental operation in 1907, and had had many minor injuries. For two years he suffered from frequent colds with cough and expectoration, and much dyspnea and palpitation of the heart. In January, 1918, the tonsils were removed. The symptoms of aneurism began in the summer of 1917. He had dyspnea, pain in the chest, and he stopped playing golf. February, 1918, he developed a severe cough. His condition rapidly progressed, the dyspnea increased to orthopnea, and when examined the patient was flushed and slightly cyanosed. The veins of the head

and neck were distended. There was a large pulsating elevation in the upper portion of the right chest extending from the clavicle to the fourth rib, and from the right border of the sternum about 2 cm. beyond the right midclavicular line. The pulsation was powerful, both lifting and expansile. There was a dull systolic and diastolic note heard over it, but there was no thrill nor bruit. The second aortic

and 26 ft. of wire made of a gold and platinum alloy.

The operation was then performed with the assistance of a neurologist who managed the electricity. No difficulty whatever was experienced. The needle was inserted into the aneurism without a local anesthetic and the puncture caused practically no pain. The tissues in this region were tense and probably partially numbed.

PLATE 1.—Taken May 20, 1918, just before wiring.

sound was accentuated, and Sibson's sign was present. There was a distinct tracheal tug. The patient complained of intolerable and constant pain in the upper part of the right thorax. Respiration was difficult. There was slight dysphagia and edema of the feet.

He was transferred to the Base Hospital at Camp Wheeler, where I was then on service, and x-rays were taken by Major Wheat. Wiring was then suggested and accepted by the patient and his physicians. It required four days to secure the needle

The wire was passed in rapidly. Altogether about fifteen minutes were required for its insertion. As is usually the case there was difficulty with the electricity. No current apparently passed until about fifty milliamperes were reached. This caused distinct spasm and pain. After four trials it was discontinued, but probably the patient had about as much effect from the electrical current as can be obtained. Immediately there was relief from pain. The wiring was done at 11 o'clock. The same night he slept horizontally without an opiate and

without excessive dyspnea. Within a week the antisyphilitic treatment was commenced. By this time the patient was sitting up and in two weeks he returned to his home in the city, coming to the hospital about once a week to receive injections of salvarsan.

There were no setbacks nor relapses. The condition was steadily progressive. The dyspnea disappeared. The patient was not, however, permitted to take any severe form

The urine contained mucus, but was otherwise normal. The physical examination showed some herpes libialis, evidently recent, due to the cold; normal reaction of the pupils; slight lateral movement of the head synchronous with the pulse; apex beat in the sixth interspace; area of cardiac dulness extended from the midsternum to $\frac{1}{2}$ cm. outside the left midclavicular line; there was a loud rough murmur heard best

PLATE 2.—Taken May 24, 1918, just after wiring.

of exertion. The dysphagia also ceased, and when last seen at the camp, about three months after the wiring, he insisted that he felt well and was anxious to return to work.

From time to time satisfactory reports were received. On the 6th of December, 1919, he came to Philadelphia to report to me. His weight then was 185 pounds. He complained of a slight cold, cough, and expectoration. At this time his red cells were 4,720,000, white blood cells 14,200. The sputum was examined and was negative.

at the aortic cartilage and transmitted into the neck; no accentuated sounds; there was a distinct deviation of the trachea to the left and vigorous tracheal tug. The lungs and abdomen were normal. The knee-jerks were active.

The evidence regarding the Wassermann was contradictory. In Philadelphia it was taken and found to be four plus. Two Wassermann's, however, were taken in the south, one in Macon and one in Asheville, about the same time, and both were negative.

I have heard from him on several subsequent occasions, the last being March 12, 1921. Dr. Minor writes to me:

"As regarding measurements with the fluoroscope, they have stayed very much the same. There is an entire absence of symptoms. He is looking and feeling very well."

As the illustrations show, this patient had a very large aneurism. At the time of

The needle must be of gold to hold the enamel. The wire must also be of an alloy of gold and platinum. I have recently wired an aneurism with gold wire and found it most unsatisfactory, on account of the difficulty of its insertion.

A local anesthetic is usually unnecessary, and I think undesirable, because it slightly increases the danger of a local infection. The pain of the puncture is not greater than

PLATE 3.—Taken May 11, 1921. Present condition. The contraction is not as much as would appear from these pictures because the first two were not taken with the tube at six feet distant as was the last.

wiring it seemed as if he could live at most only a few weeks. The whole appearance of the case was changed by the wiring, and although it is questionable whether the syphilitic infection has been entirely cured, he has been restored to a life which, with the exception of outdoor sports, is as active as he has ever had. There can be no question in my mind that the beginning of this improvement was due solely to the wiring. It is hardly necessary to discuss the technique, but there are certain features upon which stress may be laid.

that of a puncture for the inoculation of typhoid bacterin. A most scrupulous antiseptis should be observed. Although I have never known a local or general infection to occur, it is a possibility we must always bear in mind.

The greatest difficulty that I have experienced has been with the application of the electricity. This should always be done by an electrotherapeutic expert. The apparatus should be tested before it is employed. Even under these circumstances it will be found very difficult to get the

correct amount of current. A large pad placed over the back will facilitate the electrical application considerably. I have been inclined to think that the initial dose is too low, and it is quite as satisfactory to start with fifteen or twenty milliamperes. This curtails the time of the operation and apparently does not in any way affect the result.

The results of the operation have almost invariably been immediate cessation of the pain, immediate improvement in the dyspnea, and immediate reduction of the pulsation; the latter, however, has failed to occur in two of my cases, at least in the beginning.

The ultimate result as far as I have followed these cases, which has been in less than half, has been satisfactory. In the case that I here report, which has been followed most carefully, there has been, as the illustration shows, a distinct reduction in the size of the aneurism. The mechanism of this I do not understand. There is no evidence that organization occurs in an aneurismal clot. Probably there is a certain amount of contraction due possibly to inspissation of the clot. There is also doubtless some pressure from outside on the aneurismal sac, and when the blood fails to fill it and cause distention, there may be enough pressure outside to cause it to shrink. At any rate, in the course of three years a distinct shrinkage has evidently occurred.

The ultimate prognosis is a matter of speculation. A man with a condition of this kind may fall dead almost any time. Under favorable conditions there is no reason to suppose he may not live indefinitely, particularly if the syphilitic inflammatory process in the wall of the aneurism can be controlled by treatment.

If one may draw conclusions from a single case and from experience with 15 others, the following statements seem to be justified:

1. That the Moore-Corradi method of wiring aneurisms properly employed is harmless.

2. That in the majority of cases it relieves the objective symptoms almost immediately.

3. That objectively the patient improves and that the cardiac condition seems for a time to become better.

4. That the improvement is not impaired by antisiphilitic treatment, but distinctly increased.

5. Probably the antisiphilitic treatment is a valuable therapeutic measure in these cases, reducing the syphilitic inflammation in the wall of the artery that has brought about the aneurism, and when thoroughly administered improves the prognosis.

6. That there is no reason, even in severe cases of aneurism of the aorta, to regard the termination as likely to occur within a short period of time; that the prognosis therefore may in certain cases be favorable.

The Liberation of Free Salicylic Acid from Sodium Salicylate in the Circulation.

In the *Journal of Pharmacology and Experimental Therapeutics* for June, 1921, HANZLIK, in his conclusions, states:

1. Free salicylic acid is demonstrably liberated from sodium salicylate at a very low degree of acidity, namely, an acidity whose hydrogen-ion concentration corresponds to $\text{pH}=6.7$; more definitely at $\text{pH}=6.5$.

2. The presence of 25 per cent serum or plasma in salicylate "buffer" mixtures prevents the liberation of free salicylic acid at the high degree of acidity of $\text{pH}=5.9$.

3. Therefore, it is improbable that free salicylic acid could be demonstrated in the circulation during life.

4. This was fully confirmed on animals subjected to fatal asphyxia and whose cardiac and arterial bloods were rendered very slightly acid ($\text{pH}=6.8$ or 6.9).

5. Consequently, the theory that free salicylic acid, liberated by virtue of the greater CO_2 content of venous blood of the right heart, exerts an antiseptic action and prevents the development of a right-sided auriculoventricular (tricuspid) endocarditis in rheumatic fever is untenable. An explanation of this phenomenon must be sought elsewhere.

Editorial

THE PROPER ATTITUDE AS TO DIABETES MELLITUS.

As we have said before, the very common custom of examining urine with Fehling's test and getting a positive reaction often leads a physician to the statement that his patient has diabetes. It has been manifest for many years that a statement based upon such a foundation is very prone to be erroneous, and more recent investigations as to diabetes itself and as to the reducing substances which may be found in the urine prove that we should be most guarded in reaching a diagnosis and expressing an opinion until every fallacy has been, if possible, eliminated; or as has been recently expressed by Graham in the London *Lancet*, it is incorrect to say that every patient that passes a reducing substance in the urine is suffering from diabetes mellitus. Before such a conclusion is reached the nature and amount of the reducing substance must be investigated, and even if dextrose is present the diagnosis of diabetes mellitus is not necessarily correct. It is never to be forgotten that an old Fehling solution may reduce itself and that errors in the technique of carrying out the test may give erroneous conclusions. These errors are to be particularly guarded against if the reduction does not take place for a number of minutes.

The next step should be the use of the fermentation test with yeast to determine if the reducing substance will ferment, and if the physician can subject the urine to the polariscope, this method of investigation should be added. As uric acid, creatinine and salicyluric acid will reduce Fehling's solution, it is probably best to use Benedict's solution in the majority of cases.

Not long since in these columns we called attention to the possibility of lactose giving

a reaction for sugar, and pointed out that Mathew had advised the use of the fermentation test to show that lactose and not dextrose was present. Lactosuria is practically met with only in nursing women or in those who have recently been nursing, and, therefore, is not prone to act as a complicating factor in the majority of cases. Levulose may, however, be present, is thought to be indicative of hepatic inadequacy, and its presence can only be differentiated from lactose by determining whether the solution is levulorotary or by certain chemical tests not commonly used by clinicians. It is important to remember that the presence of levulose in the urine does not indicate that a patient has diabetes mellitus and that a strict regulation of the diet will usually clear up a levulosuria.

In this connection we note with interest that Graham describes a class of cases to which he gives the name "diabetes innocens," which consist of a group, rarely met with, in which the loss of sugar is associated with no symptoms, the patient having glycosuria year in and year out without apparently any ill effect, and passing sometimes as much as 10 to 30 grammes a day, the amount of sugar, however, being little influenced by the intake. On the other hand, starvation for twenty-four hours in such cases may almost entirely eliminate the sugar from the urine. Without doubt many physicians have met with cases of glycosuria of this type and have done wisely in not applying the term diabetes to them even if the words "diabetes innocens" are used.

Graham thinks that the diagnostic points are as follows: Sugar is not present in each specimen, the urine only after meals containing sugar and the fasting urine not any. The amount of sugar bears some relation to the amount of carbohydrate, and there is a rapid disappearance of sugar with one

day of starvation. Again, the fact that an increase in the diet does not cause a re-appearance of sugar for an indefinite period is of importance, and last of all, if sugar tolerance is tested with a full dose of sugar and the blood sugar estimated at the same time it will be found that no sugar is passed when the blood sugar is normal, but only when the blood sugar is high. In other words, it would appear that a major difference between so-called diabetes innocens and real diabetes is that the sugar threshold is very high in the mild type of case. Graham goes so far as to state that diabetes innocens needs no treatment, although he admits that if a patient is treated as a diabetic no harm will ensue.

He records one patient who thirty-five years ago was passing thirty grammes of sugar a day, the patient being a woman. Still another case in which a girl at the age of eight was watched for nine years. Both of them have continued very well and lead active lives with no restrictions. Nevertheless it is manifest that patients of this type should be a little more guarded in regard to their method of life than the average individual.

Concerning true active diabetes, Graham does not believe that the custom of dividing these cases into alimentary and pancreatic types is correct, but thinks that they should be divided into the mild type, the medium type, and the severe type. The mild type is a degree removed from diabetes innocens. It is met with most frequently in elderly people, as we all know, and in this connection a very interesting clinical point is to be recorded, namely, that sometimes it seems to be rather the result of a concomitant condition than the cause.

We are prone in the presence of a slowly developing gangrene to examine the urine for sugar and to conclude that diabetes is the cause, but just as soon as amputation is performed, unless secondary septicemia develops, the sugar may disappear and remain absent, and Graham states that in many cases of carbuncle associated with glycosuria the carbuncle tends to increase the sugar lost, and its cure, if possible,

may result in a disappearance of the glycosuria.

Many of the patients belonging to the mild type have no symptoms until some complication arises, but in the medium type, often seen in young patients, the amount of sugar which is eliminated may be very large, and loss of energy and the presence of pruritus and thirst may be the predominant symptoms. A careful analysis of the blood sugar in these patients will show that it is always above the leak-point, and any error in diet immediately greatly increases the sugar loss. In the severe type, Graham would place those rather unusual cases in which a mild or medium case is suddenly converted into a severe one by an intervening illness or in which the disease itself is of very sudden onset. These latter cases are often so sudden that the patient can actually state the day upon which the disease began. Graham quotes Garrod as having seen a young woman who had become unconscious on the morning of his visit, yet had seemed well before that day. In these severe cases the amount of sugar eliminated may be very large.

We have met with instances in which quantities of sugar in the urine were far in excess of those quoted by Graham. He speaks of 200 to 300 grammes in twenty-four hours. We have met with several cases in which these amounts have been practically doubled. In many of these patients the blood sugar remains high notwithstanding the great quantities of sugar which are lost through the kidneys.

Finally, there is a type of case not directly referred to by Graham which deserves attention, namely, that type in which the quantity of sugar in the urine is comparatively slight, whereas the blood sugar may be inordinately high. This condition may be explained from one of two points of view: either the kidney has been driven so that it is exhausted and, therefore, its power of elimination is decreased, or, on the other hand, by some process the leak-point or renal threshold, has been materially raised, if not by fatigue or degenerative change, by some other process not clearly under-

stood. This type of case provides an exceedingly interesting source of study, viz., persistently high glycemia with persistently low glycosuria. It is becoming more and more evident that an examination of the blood whereby its sugar content may be estimated is possibly more important than a similar estimation of the sugar content in the urine.

ADRENALIN THE BEST REMEDY FOR THE UNTOWARD EFFECTS OF ARS- PHENAMINE.

The development of disagreeable, dangerous or even fatal symptoms after the intravenous injection of one of the new arsenical preparations which are used in the treatment of syphilis is fortunately a rare occurrence, and this is perhaps the more remarkable in view of the carelessness with which these powerful drugs are sometimes used, both as to their preparation and as to an accurate knowledge of the state of the patient so far as his heart, kidneys, and other organs are concerned. Nevertheless every practitioner must appreciate that such an accident may develop, and he is wise to bear in mind the best remedy to be employed to combat the immediate symptoms, some of which are sometimes referred to as the nitritoid crisis.

It will be recalled that Ehrlich, some time before his death, directed, or expressed the belief, that in some of these cases the symptoms are due to a deficient secretion of adrenalin, and he advised that large doses of this substance be given hypodermically when diarrhea, suppression of urine, cyanosis, or coma followed the use of these products, and, furthermore, asserted that such a use of adrenalin will save desperately ill patients. So far as we know this opinion of the original producer of arsphenamine has not been controverted in the course of years, and it is interesting to note that it has been confirmed by more than one observer. Recently in *La Presse Médicale* of August 13, 1921, Milian, after pointing out that the technique of admin-

istration has a marked bearing on the danger of inducing a nitritoid crisis, expresses the following views: The use of a concentrated solution even of neoarsphenamine is prone to produce disaster. The reason for this is easy to understand. In all cases the injection should be slow. The time should not be less than one or two minutes. The crisis which is developed in from three to ten minutes after the injection is more severe if the injection is given rapidly than if used interruptedly and slowly and well diluted. Salt solution is far preferable to distilled water, which is hemolytic.

At the close of his discussion of the symptoms of this untoward manifestation of the influence of these remedies, he points out that while the intravenous injection of the adrenalin for the relief of the symptoms may cause headache, it also causes a slowing of the pulse, and that the use of even an infinitesimal dose of adrenalin has an extraordinary effect, the patient being saved from apparent death.

Finally he states that he who has seen these dangerous effects will rely on adrenalin and not resort to less useful remedies. His directions are that if the pulse is much quickened or the respiration is affected, the injection is to be stopped and the adrenalin given at once in salt solution by the vein, or intramuscularly into the buttocks or into the muscles of the front of the chest.

THE VALUE OF FOREIGN PRO- TEINS IN THE TREATMENT OF CHRONIC ARTHRITIS.

From time to time during the last decade a very considerable number of contributions to this subject have been made, and to most of those of importance we have called attention either in these pages or in the Progress department of the *THERAPEUTIC GAZETTE*.

We think it now may be stated as a fact that the intravenous or subcutaneous injection of foreign protein produces a therapeutic influence which cannot be denied, and while the pathological changes which

have taken place in many cases of chronic arthritis are so great that it is obvious that no method, either medical or surgical, can be curative in effect, nevertheless there is a large class of cases, both moderate and fairly far advanced, in which clinicians of undoubted reliability have obtained extraordinarily good results.

Our readers will remember that the foreign proteins which have been employed have been of the most varied character, from the use of egg-white to the injection of dead typhoid or other bacilli, and that in some respects it has seemed to make little difference what the source of the foreign protein was provided the proper dose for the individual case was given. This statement as to dose, which seems so obviously correct, is not as simple as it appears, because an extraordinary variation in the reactive ability of different patients has been found to exist, and also because doses which are so small as to produce no reaction in the sense of a chill and febrile movement have usually failed; and, on the other hand, doses which have been too large for the individual power of reaction have produced such severe effects as to seemingly jeopardize the patient or to produce such a degree of illness that both the physician and the sufferer dislike to continue the method.

At present, as we have already indicated, there is little indication that specific protein—that is, one derived from the invading microorganism—is of greater value than a non-specific protein, although therapeutically one would suppose that this would be true.

Some practitioners get excellent results not from the use of dead organisms, but from the employment of filtrates of such organisms, and during the last ten years these products have been widely employed under the name of phylacogens.

In a recent issue of the *Archives of Internal Medicine*, Snyder and Ramirez, after briefly reviewing some of the work which has been already done by them, make a further report upon this subject with special reference to the use of secondary proteose prepared from milk. They believe

that there is a certain advantage to be obtained by avoiding dead typhoid bacilli or other dead organisms, because the dose is uncertain, the bacterial counts in vaccines being only approximate, and furthermore the protein content of different types of bacteria vary widely. Then, too, such an injection, if done intravenously, introduces into the blood not only proteins, but endotoxins which must be destroyed or eliminated, and which are of the nature of by-products or useless contamination. Last of all they point out that there is always the slight danger of introducing live organisms.

Referring once more to our own experience in this matter, we wish to emphasize the fact that a certain degree of reaction must be produced after each injection if beneficial effects are to be obtained. As Snyder and Ramirez have pointed out, if the initial dose is large enough to produce a chill it is not necessary to increase the dose as long as subsequent doses continue to produce a reaction which is satisfactory. When using typhoid bacilli they employ ten million; when using secondary proteose they employed from one-half to one grain, but these were intravenous doses, and when we have employed foreign proteins we have preferred the hypodermic method.

So far as their clinical results are concerned, they report that they have had charge of seventy cases of chronic arthritis; sixty were hospital cases and ten were private cases. Naturally these cases varied greatly in severity. Six of the patients are considered cured and are at work earning their living, having previously been helpless invalids. Two of them have a slight amount of deformity due to the presence of adhesions and bony changes. Their average percentage of cures of chronic arthritis is 8.5.

The time during which the arthritis exists is also an important factor. All of their cures occurred in patients who had been ill from arthritic conditions for less than two years. Amongst those patients who were only improved and who suffered from marked deformities, they state that the greatest benefit usually occurs in the

joints of the upper extremities. In this type 50 per cent showed considerable improvement in motion and in diminution of pain, whereas in the lower extremities only 25 per cent showed slight improvement.

This method of treatment in no way interferes with the routine methods of using the salicylates, colchicum, hot packs, and massage, but this warning is to be remembered, namely, that the intravenous injection of a foreign protein is contraindicated if tuberculosis is present in any form, in cases of very high arterial tension, and in patients with valvular or myocardial disease and ruptured compensation.

THE BEARING OF THE ADMINISTRATION OF ARSPHENAMINE AND NEOARSPHENAMINE UPON FURTHER INFECTION IN SYPHILIS.

Very recently Brown and Pearce have reported a study from the laboratories of the Rockefeller Institute for Medical Research bearing the title "Super-infection in Experimental Syphilis Following the Administration of Sub-curative Doses of Arspenamine or Neoarsphenamine." While it is true that the subjects of their experiments were rabbits, nevertheless so far as we know there is no evidence to indicate the facts which they have accumulated do not hold true in the case of human beings.

After pointing out that it is generally held that a person infected with the virus of syphilis practically becomes immune to a second infection, they proceed to record the results which they have obtained, discussing the possibilities of second infection and the influence which the newer anti-syphilitic remedies have in controlling it. In other words, the point which they endeavor to elucidate has been the question whether these therapeutic agents increase the resistance of an infected individual to reinfection. The general view as to reinfection, which we stated above, has at various times been thrown into doubt by the report of isolated instances in which a

new primary lesion has developed in a person who is known to be a syphilitic from an infection at an earlier date.

It is not necessary at this point to detail the technique which was employed by these investigators, since those who are particularly interested in this part of their work can obtain their information from the *Journal of Experimental Medicine* of May 1, 1921. The point of interest to the general practitioner is that their work would seem to indicate that the existence of an infection with the spirochete of syphilis does not constitute a bar to the introduction and propagation of a second infection, and again it would appear that the diminution of virulence of the primary infection by the use of the new arsenical compounds rather increases the possibility of the second inoculation than diminishes it, provided the doses which have been employed have not been large enough to be distinctly curative in their influence. In other words, it would seem that the individual who has no treatment with the new arsenical compounds and who is exposed a second time to infection is less prone to obtain a second inoculation than one who has received these drugs in moderate amount. In the animals which they used they found these facts to be the case, namely, that untreated animals were highly refractory to second inoculation; that partly treated animals were, however, highly susceptible to a second inoculation even if the manifestations of the first inoculation had been considerably modified but not cured.

It would seem from this report that the newer arsenicals should be used in as large a dose as possible within the bounds of safety as originally advocated by Ehrlich, not only to destroy the spirochete which is already in existence in the patient, but to put the patient in such a position of good health that if exposed to reinfection he will be less susceptible than he would be if only half cured. On the other hand there are clinicians who have reached the conclusion that frequently repeated moderate doses give the best results. Much probably depends upon the virulence of the infection.

THE EFFECTS OF BENZYL ESTERS.

Much attention has been paid during the last two years to the physiological action and therapeutic value of the benzyl esters, chiefly through the publications of Macht, who, recognizing the near relationship of these compounds to one of the group of opium alkaloids, carried out experiments which seem to prove that in these compounds valuable new remedies were represented. Still further investigation by other students of the subject has also seemed to indicate that benzyl benzoate, the preparation advocated by Macht and the one which has, of course, been most largely employed, can be used with advantage to meet the many indications. The chief of these indications has been, of course, the sedation or relaxation of unstriated muscle fiber that is in spasm or unduly irritable. As with all new drugs, benzyl benzoate has been received with enthusiasm. Many favorable reports have been made concerning its use in constipation, asthma, and even in instances of high blood-pressure. Other reports have been disappointing, and within the last few months certain investigations were reported which seem to prove that, in animals at least, the benzyl esters did not possess the activity which Macht believed to be present. Benzyl succinate has been introduced with the idea that it will be equally efficacious and far less irritating to the stomach, and some of the results which have been obtained from it would seem to indicate that it is equally active as a therapeutic agent.

Still more recently Nielsen and Higgins have seemed to prove that benzyl cinnamate is more effective in its action, so far as the intestines are concerned, than benzyl benzoate, and that like benzyl benzoate and benzyl succinate it is practically non-toxic when given by the mouth. Indeed, they state they have given as much as half an ounce to a dog weighing ten pounds without any noticeable symptoms. As a result of their researches upon these various benzyl preparations they conclude that

those experiments which have been made upon animals and which seem to contradict Macht's original studies are incorrect, and therefore they support the view that these compounds can be used along the lines originally advocated by Macht.

On the other hand it is only fair to state that other investigators not only believe that the benzyl esters are not of great therapeutic value, but also express the view that if large doses are given in an effort to obtain success in a given case, these substances are not as innocuous as we have been led to believe. Thus, in the *California State Journal of Medicine* for September, 1921, Emge quotes the investigations of Mason and Pieck upon dogs, who found that antispasmodic effects could only be obtained by the use of very much larger doses proportionately than those which have been commonly employed. Indeed they found that doses which were efficient for the relaxation of spasm seemed to be competent to produce depression of the respiratory center with a marked fall in the blood-pressure and distinct weakening of the myocardium, and Emge believes that these experimental results are in accord with his clinical observation.

Emge found that full doses in human beings induce a leucopenia, and he raises the question whether this leucopenia in the presence of an infection may not be disadvantageous.

In this connection an interesting point arises as to the reliability of the experiments which have been made upon animals with this substance. Macht himself fully understood that certain animals can resist larger amounts of these drugs than others; herbivorous animals tolerating them well because they have a greater ability to metabolize benzyl compounds than do carnivorous animals. It is manifest, therefore, that the results obtained by experiments upon rabbits may be quite different from those reached in experiments upon dogs.

So far as the clinical use of the benzyl esters is concerned, we confess that our own experience leads us to the belief that they are more in the nature of placebos than very

active remedial agents, but even when benzyl benzoate has been given in as large a dose as 60 or 80 minims of the 20-per-cent solution in twenty-four hours, we have failed to observe that it produced any deleterious effects.

Errors in diagnosis, and conditions which cannot be overcome by any remedy, will often lead to disappointing results when these compounds are employed, but nevertheless as far as our knowledge goes at the present time their introduction has added something of value to our therapeutic armamentarium.

SURGERY OF THE LUNG AND PLEURA.

Moynihan's enthusiasm over the possibilities of chest surgery, justified by brilliant results, has been shared by many others. Outstanding among these is Gask, who has contributed an article (*Lancet*, June 18, 1921) giving a résumé of the accepted teaching of to-day.

Gask notes, and with much satisfaction, the practical elimination of sepsis as a cause of fatality following surgical intervention in the chest, and insists that the danger incident to pneumothorax is minor. In order to do clean and efficient work inside the thorax it is absolutely necessary, just as when dealing with the abdomen, to have a good exposure; a wide opening of the pleural cavity or mediastinum therefore becomes a *sine qua non*. The question may then be asked as to whether such a wide opening either kills the patient or causes serious respiratory disturbance; the answer is that during the war many hundreds of chests were opened without fatality or serious disturbance to the patient; and, moreover, that manipulation of the thoracic viscera was made without causing serious shock.

Intratracheal insufflation, with which is combined anesthesia, has been used successfully in lung surgery; by this method a slight positive pressure can be maintained

in the lung, and rapid and exaggerated movements which interfere with operative manipulation are minimized. The method has certain objections which are not, however, insuperable. These objections are: first, that the initial anesthesia, before insertion of the tracheal tube, must be deep enough to abolish all reflexes; and, second, that the introduction of the tube into the trachea requires a certain amount of practice on the part of the anesthetist. The method is a good one, has given good results, and must be seriously considered.

Another scheme, which has been evolved during the war, may be called the positive pressure face-mask method. This calls for the use of an air-tight face-mask with a rubber reservoir for the gases. It is, in fact, a slight modification of the gas and oxygen anesthesia apparatus, and by it a pressure of from 5 to 7 mm. of mercury is easily obtained, and may be raised still higher. This apparatus possesses the great advantage of being simple, cheap, portable, and easy to use.

In the present state of our knowledge it is more difficult to localize, say, an abscess in the thorax than an abscess in the abdomen. The rigid wall of the thorax prevents one feeling a swelling with the hand, and in the case of the abdomen thousands of laparotomies have helped to rectify errors of diagnosis and standardize methods of treatment. It can only be by a patient and careful investigation of cases, together with a systematic investigation of our findings, that like results can be obtained in thoracic surgery.

A real help toward the attainment of a diagnosis is the taking of a careful history—occasionally even a correct localization of the disease may be gained; attention must be paid to the history of pain, cough, difficulties of breathing, and swallowing.

A general survey of the whole patient is necessary as well as the well-known method of auscultation and percussion, to which reference need not be made. The need for examination of the sputum, quantitatively, microscopically, and bacteriologically, is too well known to require comment. Then we

have cystometry, and the use of the spirometer, bronchoscope, and esophagoscope—each of which has its own rather limited sphere of utility.

Exploratory puncture performed with an aspirating needle is often of definite service, though it must be remembered that a negative finding may sometimes be a hindrance rather than a help.

In the last few years the *x*-rays have proved to be a great help toward diagnosis and localization of disease, and they will probably become of much greater value when our interpretation of the pictures has improved. It would, however, be wrong to rely entirely on an *x*-ray finding and neglect the ordinary clinical methods of examination.

Exploratory thoracotomy is the right thing to do when all other methods have failed to yield a diagnosis and when it is considered imperative that one should be made. It is by a judicious use of exploratory thoracotomy that the surgery of the chest will be advanced.

The technical difficulties of opening the chest, though greater than those of opening the abdomen, are by no means insuperable. Access to the pleural cavity is usually made from behind or from the side; the medial longitudinal opening, which is the common operation of preference in case of the abdomen, is reserved for investigations of the mediastinum.

The actual opening of the pleural cavity may be made in many ways. One or more ribs may be removed—usually subperiosteally—and at the end of the operation the edges of the parietal pleura are sewn together if possible, and then the muscles are drawn together over the defect of the rib. Or an osteoplastic flap is made, lifted up, and at the close of the operation replaced *in situ*.

Personally, the author has been in the habit of excising four inches of rib subperiosteally, and then inserting a rib spreader; by this incision a good view of the interior of the chest can be obtained and a hand can easily be inserted into the pleural cavity. The author was led to adopt this

plan when operating on soldiers with wounds of the lung, when pieces of splintered rib commonly required removing. An incision through an intercostal space is simpler, gives as good a view, is easier to close, and causes less subsequent deformity.

If the exploration has to be done in the upper part of the chest, intercostal retraction may not be sufficient on account of the small amount of spring of the upper ribs. In such a case extra room may be gained by dividing the rib above and below the incision at its costal junction.

After an opening by means of an intercostal incision, the chest can be closed without difficulty by suture either passed round or through the ribs immediately above and below the incision. The former, or pericostal stitch, has the merit of being quicker; a curved needle is passed through the whole thickness of the intercostal space at the upper edge of the upper rib; it is then passed under the lower rib and out through the lower intercostal space, just sufficiently removed from the inferior edge to miss the intercostal artery. If the transcostal stitch is used, holes are punched through the ribs above and below the incision, sutures threaded through, and then drawn tight.

If the region of the chest to be explored lies in the upper and inner portion of the chest or in the mediastinum, the easiest means of access may be through the sternum.

One way is to make an oblique incision through the sternum from the second intercostal space into the notch at the top of the manubrium. A curved incision is made, starting in the middle line half an inch above the manubrium sterni, and continued in a curved direction to the third rib, one inch external to the edge of the sternum. The attachment of the intercostal muscles to the sternum in the second intercostal space is then severed and a director passed from the second space to the manubrial notch, keeping immediately under the bone; a special pair of sternum shears is then passed along the track of the director and the bone split. The two surfaces of the sternum are then clawed apart with retrac-

tors, and good visible access is gained to the upper part of the mediastinum and the pleural space.

A second method is to split the sternum down the middle and turn up a flap consisting of sternum and the attached ribs. Two small trephine holes may be made with a Hudson trephine, one opposite the second and the other opposite the sixth or seventh interspace; the sternum is then split medially between the two holes by the sternum shears; next, two cuts are made outward, one from each trephine hole, through the sternum into an intercostal space, and a flap consisting of sternum and attached ribs lifted up. The internal mammary vessels are then brought into view, ligatured, and divided. The costal-sternal flap can then be lifted up and an excellent view of the mediastinum obtained. At the end of the operation the flap can be replaced, sutured in position, and the chest completely closed.

The question is often asked whether it is possible to remove an entire lobe of a lung for such a disease as bronchiectasis or carcinoma. It is not at all difficult to remove a portion of the periphery of the lung; it has often been done for the removal of an injured portion of the lung during the war. Removal of the entire lobe presents certain difficulties; but it has been done successfully, and may be done again if really required. The difficulty lies in the permanent closure of the bronchus. The method suggested by Willy Meyer recommends itself, namely, an adaptation of the usual way of securing and invaginating the stump of the appendix after appendectomy.

The treatment of an ordinary straightforward case of empyema has not changed markedly for hundreds of years. In olden times it was opened by a cut with a razor through an intercostal space or by burning a hole with a red-hot iron. The latter method was preferred by some surgeons as being "less dolorous."

At the present time the usual treatment is to open the chest and drain the pleural cavity by means of a rubber tube, either

through an intercostal incision or by excising an inch or so of rib. As the discharge lessens the tube is shortened, and if all goes well, as it often does, the partially collapsed or compressed lung expands, becomes adherent to the parietal layer of the pleura, and the patient is cured after a few weeks, though the chest may show some permanent flattening on the affected side. But all cases do not run such a favorable course; in many patients the external wound tends to close before the pleural cavity has become obliterated, and has to be reopened perhaps two or three times in order to evacuate a collection of pus. In such cases a permanent cure may still be obtained, at the expense of a more or less collapsed lung and a greatly thickened pleura. In other patients—luckily a minority—there is a persistent sinus, which if untreated lasts for years and is a source of grave danger.

It is universally recognized that a collection of pus in the pleural cavity is a dangerous condition, and it behooves us to consider whether the classical treatment can be improved on.

The first improvement to be noted is that which has followed making an airtight closure around the drainage-tube which is inserted into the chest, and leading a tube from this to a vessel partly filled with water under the bed, so that pus may drain out and air may not be sucked back; by this device the lung is encouraged to expand more quickly, so as to obliterate the pleural space. It is not necessary to dilate on the many devices which have been invented to accomplish this end.

Another procedure which is still very much in the experimental stage, and therefore *sub judice*, is that of evacuating the pus in the pleural cavity by open operation followed by immediate complete closure. During the last war medical officers had many cases of hemothorax to treat. A certain proportion of these became infected and developed empyema, being usually opened and drained in the classical way. It was found, however, that if the infection was diagnosed at a very early stage the

chest could be opened, the blood-clot cleared out, and the chest closed without having to be drained. It is true that the number of patients treated in this way was small, and that there were many failures requiring subsequent drainage. It is also true that once infection had been established for several days the method appeared to be useless; moreover, success depended greatly on the amount of infection and the nature of the infecting organism, for in the presence of streptococci failure was the rule.

There seem to be only two accepted methods of treating a chronic empyema sinus. One is to remove a sufficient quantity of the bony thorax, so as to allow the parietes to fall in and obliterate the cavity; this is done by means of the well-known operation of Estlander.

There is yet another device for curing a persistent empyema sinus which has been used by Beck, of Chicago. He has skin-grafted the interior of the tissues and has shown patients cured in this manner. The method is not likely to be widely used; it is difficult to carry out, and the patient is left with a deep hole in the side, covered by skin, but difficult to keep clean and non-odorous.

What is the position of surgery at the present time toward tuberculosis of the lung? About 1800 a certain number of surgeons conceived the idea that portions, or indeed the whole, of the lung might be removed. Animal experiments were performed which proved that portions could be removed with safety, the remaining lung expanding and filling the pleural cavity. On the strength of these experiments a certain number of operations were undertaken for the removal of portions of lung affected by tuberculosis.

With regard to these operations it may be said that they are never likely to have a wide application; not only because it is nearly certain that more than one part or more than one lung is affected, but also because in the early stage (in which alone surgical measures would be justifiable) there is a good chance of securing a cure by medical methods. There is a very gen-

eral feeling, too, among surgeons that surgical treatment of tuberculosis should become less and less as our knowledge of preventive and curative medicine increases. As an example of this statement, one may turn to the treatment of tuberculous glands of the neck. Ten or fifteen years ago the removal of tuberculous glands in the neck was one of the common performances in hospitals; now it is rare, for the glands are cured in other ways.

Of collapse of the lung by nitrogen no mention need be made here, for it is fully dealt with in medical books. When nitrogen replacement fails owing to adhesions preventing collapse of the lung, it may become necessary to remove a certain amount of the bony thorax to allow the chest wall to fall in.

NEUROLOGICAL SURGERY.

Although we dealt with this topic in the editorial pages of the September issue of the *THERAPEUTIC GAZETTE* its importance justifies its further consideration in this issue.

Cushing (*Ohio State Medical Journal*, June, 1921), continuing his review of neurological surgery, states that it is true of all intracranial operations that in the knowledge of ways and means of controlling tension lies the secret of surgical success. Intracranial overtension is largely a matter of an increase in the fluid content of the chamber, whether it exists as free fluid in the ventricular and arachnoid spaces or as an edema, a state to which the nervous tissues are particularly prone. Though formerly the extensive withdrawal of fluid was looked on with apprehension, it has come to be an essential step in many craniocerebral operations.

Weed, by adapting the principle of injection of non-granular fluids from which granules might subsequently be precipitated, showed conclusively that the arachnoid villi represent the points of escape for fluid which, by a process of seepage, enters directly into the pachymeningeal sinuses.

Weed's continuation of these studies on his return to Baltimore and his demonstration of the manner of development of the fetal arachnoid spaces stand as the most important contribution to our knowledge of the meninges since Key and Retzius.

If it be true that most cases of congenital hydrocephalus can be accounted for by a faulty development of the villi, the rational treatment is to reproduce in some way this channel of outflow either by direct drainage into one of the larger sinuses or by encouraging the formation of new villi.

In a recent paper, which has aroused great interest, Dandy has put forth some very definite claims regarding the localizing value of what he calls ventriculography in cases of brain tumor. This, in other words, is the taking of Roentgen-ray plates of the cerebral ventricles after their fluid contents have been removed and replaced by air.

Another procedure, likewise in an experimental stage, though capable, it is hoped, of further development, is the diagnostic puncture of the cisterna magna, a procedure worked out in the Army Neurological Laboratory under Dr. Weed's direction during the war, and which has subsequently been warmly advocated by James B. Ayer. When one realizes how loath the profession was to adopt Quincke's lumbar puncture as a more or less routine measure, one hesitates to say that a suboccipital puncture will not some day come to be as commonly employed.

Probably the most suggestive papers issued by this laboratory during its short life were those by Weed and McKibben on the experimental alteration of brain volume following the intravenous injection of various substances in solution. They observed that, after the cortex was exposed by a trephine opening, the intravenous injection of a watery solution caused the brain to protrude through the opening, and contrariwise, that hypertonic salt solution caused it to recede, sometimes to a very extraordinary degree.

They found, in the first place, that it would answer almost as well to give sodium chloride by mouth, and it is at times quite amazing to see what an immediate symp-

tomatic effect, particularly when there is increased intracranial tension, this simple procedure may have.

That it is not entirely free from risk we have reason to know. Great hopes were aroused, particularly from a prophylactic standpoint, by Crowe's discovery of the passage of hexamethylenamine through the choroid plexuses and its prompt appearance, after administration by mouth, in the cerebrospinal fluid. We did not know at the time that it appeared unchanged, and that only in an acid medium like the urine was it broken up with the liberation of formaldehyde. Crowe's observations, however, on the efficacy of the drug, particularly as a prophylactic, in experimental canine meningitis were nevertheless so convincing that we have continued with its use in certain conditions—in patients with basal fracture, before transsphenoidal pituitary operations, and so on. It certainly does no harm, though we may have been leaning on a broken reed.

There is no more satisfactory operation in surgery than the removal of an accurately localized endothelioma of the spinal meninges—no operation, unless it be for some of the major trigeminal neuralgias, in which the transformation from a suffering and bed-fast invalid to a normal life is more like resurrection. It does not do merely to tilt these lesions out; the meningeal attachment from which they take origin must also be removed, and this is not altogether easy since the central point of attachment seems invariably to be at the point of emergence of a segmental nerve root.

It is astonishing how promptly it begins and how great a degree of functional recovery is possible in the flattened cords long subjected to pressure by such a tumor. What is more, the promptness with which this restoration sets in may be taken as an evidence of the delicacy with which the tumor enucleation has been conducted.

Cushing classifies the results of traumata as hematomyelias; the total cross-lesions usually from fracture dislocation; and partial injuries; the latter being the only ones suitable for surgical intervention.

Many facts have been brought to light

regarding the localization of function in the cord, but possibly the most immediately arresting are those incident to the studies of Henry Head and his coworkers. Their observations have shown that, even when in its cross extent the lesion has been anatomically complete, the cord distal to the lesion is capable of resuming its reflex function to a degree hitherto unappreciated. This process, in the absence of infection, begins to set in after the third week, at which time the lower spinal reflexes begin to reappear. Hence the old conception of a permanent loss of deep reflexes with flaccid paralysis as an indication of a total transection falls to the ground.

Cushing closes his study with the following observations: There is a problem relating to the care of these patients for which the war does not seem to have given a satisfactory answer, namely, the correct method of dealing with the bladder in the early stage of retention. The main desideratum, if one hopes to attain for his patient a subsequent automatic bladder control, is the avoidance of infection, and whether a constant drainage by catheter from the outset, repeated catheterization, suprapubic drainage, or the avoidance of any direct interference whatsoever and letting the bladder distend till it dribbles—which of these methods is best no one so far has been able satisfactorily to determine, nor in this generation will we again, let us hope, have so good an opportunity of finding out.

The surgery of the peripheral nerves, other than cranial, belongs largely though not entirely to the domain of traumatic surgery, and as injuries of the larger nerves are often coupled with deformities and need what is called physiotherapy, together with some supporting apparatus in their after-care, a bid for these lesions during the war was made by the orthopedists.

It was calculated that fully 25 per cent of all major injuries of the extremities were accompanied by a more or less serious involvement of important nerve trunks, and it makes little difference who cares for them—if an orthopedist, he must have a better neurologic training and operative technique than most possess; if a neuro-

surgeon, he must familiarize himself more than he is accustomed to with the mechanical correction of paralyses. The subject at all events received a great fillip during the war, and much has been learned and much unlearned regarding nerve sutures. Attention may be called to a few points which stand out clearly from the great number of published observations.

It has long been known that divided nerves, given half a chance, tend to reunite. Indeed, under circumstances when a purposeful section or avulsion of a nerve has been made it is well-nigh impossible at times to prevent some degree of functional reunion. This the old-time peripheral operations for facial neuralgia made only too clear. What takes place has been more or less a subject of academic dispute between the supporters of the neuron doctrine and those of Bethe's school, who believed in the possibility of a peripheral regeneration of axons. Though Bethe undoubtedly found axons in the peripheral segments, Langley's explanation of their presence was doubtless the correct one. In short, the proliferation of the cells of the neurilemma sheath is the only peripheral process, and though this prepares the way for the axon, unquestionably the axis cylinder must grow down from the proximal segment.

From the great mass of material of the past few years the curious observation was soon made that certain nerves show a much greater tendency to perfect functional reunion than others. To take a single example, the prognosis after injury and suture of the musculospiral was far better than after a corresponding injury of the median. This appeared, moreover, to have no relation to the distance between the seat of the injury and the periphery, for a high radial suture was more favorable than a low median. The explanation for this which seems best to meet the facts is that the functional recoverability bears relation to the degree of purity, whether sensory or motor, of the nerve in question. Thus the musculospiral nerve has a great preponderance of motor fibers, and consequently after suture there is less chance of motor axons finding their way down sensory pathways

and the reverse than if the number of sensory and motor fibers were more nearly equal, as is true of the median.

One thing has been made clear beyond question, and that is the supreme desirability of bringing the two ends of the severed nerve together without the interposition of a bridge, and ingenious ways and means of accomplishing this have been devised, not only by stretching and by mobilization of the nerves, but by shortening the gap in case of great loss of substance by retaining the limb in a position of acute flexion until union has taken place.

It will be a bad thing for neurologic surgery when it becomes fashionable. Gynecology has already suffered from this, and orthopedics is in the way to follow. Tendencies in this direction are apparent. Glad as Cushing is to feel that the importance of the subject as a special line of work is

becoming recognized, and confident as he feels that the day will come when professors of neurology in our schools will have had a surgical training, just as the present-day gynecologist and orthopedist must have, nevertheless the way to bring about this desired end is not through the surgical operating-room alone, but by the slow process of the neurologic clinic and the laboratory. Let us hope that some day in a national institute the all-around training which is essential may be properly acquired by medical graduates desiring to enter this field.

But for its own good, Cushing prays that neurologic surgery may never get so far from the home of general medicine and its immediate parent, surgery, that there will be an estrangement, or any possibility of its being shut out-of-doors when the time comes for its return.

Progress in Therapeutics

Medical Therapeutics

The Eradication of Diphtheria by Means of Toxin-antitoxin Following Schick Testing.

In the *Pennsylvania Medical Journal* for April, 1921, BAUER states that heretofore in the Philanthropic Health Department they have used diphtheria antitoxin to immunize all that were exposed to diphtheria; in some cases with a frequency that made it uncomfortable and possibly dangerous. Realizing the temporary nature of this passive immunity, a better method was devised and found practical—the active immunization of susceptibles with toxin-antitoxin. The immunity thus obtained is slow in its development, but its benefits are long standing. True, Schick testing and active immunization should not be deferred in their use until an epidemic or direct exposure to diphtheria has taken place be-

cause of the length of time necessary to make the reading in the test, which is best interpreted at seventy-two hours, and the development of the immunity, for which about twelve weeks is required. Nor can the toxin-antitoxin and diphtheria antitoxin be used at the same time, because both immunities, active and passive, cannot be developed simultaneously. The proper procedure then is to test all children without awaiting exposure and to immunize susceptibles actively.

Will the passive immunity of early infancy as transmitted by the mother to the child—provided that she has an immunity of her own that she can transmit—interfere either with the test or active immunization? These children so immunized always give a negative Schick reaction, but their tests become positive when they lose this trans-

ferred immunity, usually at the end of six months, but frequently enough if it lasts up to two and in a few cases even up to three years. He believes that toxin-antitoxin has protected some of these past this age, but his work has been limited to one hundred cases, all of which have not as yet passed out of the period of infancy. Since no ill effects attend the administration of toxin-antitoxin in these infants, he is inclined to continue its use, and if necessary, following Schick testing, repeat it after the third year. As yet he has no infant that has required reimmunization because of a positive Schick test. One drawback to this procedure is the fact that three doses, 1 Cc. each, must be given at weekly intervals to insure favorable results.

In more than twelve hundred cases given toxin-antitoxin, including all ages, he noted several facts of considerable interest. Since his work extends over a period of but one year, it will be impossible to give any idea of the permanency of active immunization. Suffice it that in institutions where diphtheria was previously constant and this combined procedure employed, diphtheria does not now occur. He has noted that young children give no constitutional reaction to toxin-antitoxin. The older the individual the more apt is a reaction to occur. This is due to the bacillus proteins contained in the mixture, and the reaction is more likely to occur in a person who has a pseudo as well as a positive reaction to the Schick test. At least 34 per cent of adults will give these pseudo-reactions.

Children that react to toxin-antitoxin do so only after the first dose, as a general rule, and reactions to subsequent doses are milder, if they occur at all. The statistics compiled as a result of the work at Girard College, Philadelphia, are significant. Five hundred and forty-four of a total of sixteen hundred boys received toxin-antitoxin. One hundred and nineteen gave a reaction after the first dose; of these, nineteen reacted after the second dose, but more mildly, and after the third dose nine of the nineteen gave even milder reactions. None who did not give reactions to the first dose

gave any reactions to subsequent ones. These boys ranged from six to sixteen years of age, and as Dr. F. L. Greenwalt, physician in charge of the college, expressed it, "None of the reactions were as severe as many that one sees following vaccination against smallpox." Bauer's observations on these and other reactions in children lead him to consider this statement a conservative conclusion judiciously arrived at by a cautious observer.

Some Uses of Modern Radiotherapy.

In the *California State Journal of Medicine* for April, 1921, RODENBAUGH states that the treatment of tuberculous adenitis by radiotherapy is an established procedure. Cures are produced in over 90 per cent of the cases, and the end results are superior to those of other methods. This method leaves no deformity, and during treatment the patient's general condition is greatly improved. In most cases, after radiotherapy, the nodules disappear entirely. In a small percentage of cases they remain small and hard, the result of fibrous changes. Surgery is rarely indicated in tuberculous adenitis, but care should be taken that other foci of infection, such as teeth, tonsils, and adenoids, are removed to secure the desired result.

The use of radiotherapy in Hodgkin's disease, the leukemias, and lymphosarcoma is well established and offers the best known method of treatment for these conditions in the light of our present knowledge.

The treatment of incipient cataract offers the most striking results of any method yet used to check and absorb the progress of lenticular opacities. In over 80 per cent of cases there has been a marked improvement. Excellent results have also been obtained in vernal catarrh and trachoma.

In hyperthyroidism the efficacy of radiotherapy is well established, but there is still a wide divergence of opinion as to the end results of both surgery and radiotherapy.

This divergence of opinion is probably due to the difficulty and frequent inaccuracy of diagnosis. The use of basal meta-

bolism estimation seems to have placed the diagnosis of hyperthyroidism on a fairly sound basis, and is particularly valuable when used to control treatment. Naturally, colloid, cystic, and nodular goitres, and those causing marked pressure symptoms, are not amenable to radiotherapy.

In a well-controlled group of cases the work of Means and Aub and others, comparing the end results of radiotherapy, surgery, and medicinal treatment of exophthalmic goitre, can be taken as fairly indicative of the proper method of treatment in such cases. They conclude that the safest programme for the treatment of exophthalmic goitre as a whole is routine radiation of thyroid and thymus with surgery held in reserve for cases that do not respond.

The use of radiotherapy in goitre does not subject the patient to primary surgical mortality, there is a shorter rest period necessary, and the end results are usually better. These cases, then, should logically be given the benefit of this benign method of treatment before instituting any more radical form of therapy.

Vaccination Against Influenza and Some Other Respiratory Infections.

In the *Journal of Infectious Diseases* for April, 1921, JORDAN and SHARP state that the prophylactic effect of a widely used vaccine containing Pfeiffer bacilli, streptococci and pneumococci has been studied clinically and statistically. They have recorded during a period of about seven months the respiratory ailments which developed among 6066 persons, approximately half of whom had received the vaccine. Some of these were attacked by influenza in the 1920 wave, which occurred within two months of the vaccination; in addition, the usual number of pneumonia and common cold cases among those observed afford material for comparisons.

Rhinitis and bronchitis developed with frequency about equal in vaccinated and unvaccinated groups.

The influenza attacks among the 2873 vaccinated numbered 118 (4.1 per cent) and among the 3193 unvaccinated numbered 152 (4.8 per cent); 7 pneumonia complications with 2 deaths occurred among the 118 vaccinated patients, and 12 with 2 deaths in the 152 unvaccinated. Both the influenza and pneumonia attack rates are hence somewhat lower among the vaccinated, but the difference is not great. Pneumonia, not associated with influenza, was also less frequent among the vaccinated, only six of 19 pneumonia patients having been vaccinated. The small numbers hardly warrant, although they suggest, a favorable conclusion regarding some slightly prophylactic value for pneumonia. That any considerable degree of protection against influenza was conferred by the vaccine seems unlikely.

Indications for Infusion of Blood Substitutes and Transfusion of Blood in Cases of Traumatic Hemorrhage and Shock.

In the *California State Journal of Medicine* for April, 1921, BUTLER states that any case of shock that continues to register a systolic blood-pressure of seventy to eighty millimeters of mercury after the usual treatment for the relief of shock, such as external heat, relief of pain, and an infusion of seven-per-cent acacia or six-per-cent glucose solution, should be transfused with from 600 to 1000 Cc. of blood from a tested donor. Transfusion should be resorted to regardless of whether the circulating blood has been changed by hemorrhage or exemia.

If following the application of external heat, relief of pain, and infusion of acacia or glucose solution the blood-pressure takes a decline and drops lower than the previous low mark, and does not rise again following another infusion of acacia solution, transfusion with a compatible blood is demanded.

A hemoglobin of twenty-five per cent or less always calls for transfusion.

If a patient is exsanguinated, transfusion of blood from some healthy indi-

vidual, without waiting for the ordinary tests, is indicated. Infusion of acacia solution, or even physiological salt solution, should be given while preparing for the transfusion of blood. This transfusion, without waiting for compatibility tests, is to be resorted to only in extreme cases, where any delay whatever would be fatal.

Vitamine Content of Honey.

In the *American Journal of Physiology* for April, 1921, HAWK, SMITH, and BERGEIM state that strained honey was found, by experiments on albino rats, not to contain more than minimal amounts of the growth-promoting accessory substances, fat-soluble A and water-soluble B. Comb honey was found to contain the fat-soluble vitamine in moderate amounts. Honey did not protect guinea-pigs against the development of scurvy. The addition of honey to bread did not appreciably delay its digestion in the human stomach.

Analysis of More Than 200 Cases of Epilepsy Treated with Luminal.

In the *American Journal of Insanity* for April, 1921, KIRK states that the use of luminal in the treatment of epilepsies in the Arkansas Hospital for Nervous Diseases was instituted with considerable skepticism and only with the hope of controlling the seizures and not with the expectation of a cure of the disease. On December 8, 1919, he selected as cases to be treated a certain number of patients whose seizures were the most frequent and the most severe, some of whom had been bedridden for weeks, months, and even years. He felt that if luminal would improve the condition of these patients we would then be justified in proceeding in the treatment of milder cases. The results in certain cases were so startling and so remarkable that within thirty days all cases of idiopathic epilepsy were placed under this treatment. His method of treatment consisted of $1\frac{1}{2}$ grains of luminal at bedtime. Luminal was prepared

in tablet form. After about sixty days his supply of luminal was exhausted and it was necessary to use luminal-sodium. The luminal-sodium seemed to be as effective as the luminal. At no time did he notice complaint on the part of the patient of being dizzy or heavy with this dosage. Within a few days he noticed a change in the number and severity of the seizures of the patients who were under treatment. He did not increase the dosage except in five instances. In these particular cases he used $1\frac{1}{2}$ grains of luminal or luminal-sodium night and morning, and in two instances he used it three times per day, but after the seizures were under control he then resumed the old method of $1\frac{1}{2}$ grains at bedtime.

On May 1 his supply of luminal and luminal-sodium was exhausted, with the exception of a small quantity which had been reserved for the use of serious cases and cases of status epilepticus. Within a few days after his supply of luminal was exhausted there was a very noticeable increase in the number and severity of seizures, but this was not equal to the conditions as they existed previous to the treatment and up to the time of his report, May 26, 1920. He does not agree with one writer who claims that the seizures were more severe and more frequent than ever before.

All stimulants, tea, coffee, tobacco, were prohibited. No change in the diet was made, except a closer supervision was exercised over the diet of the patients in regard to the quantity of food eaten. We are all familiar with the tendency of the epileptic to gormandize. He learned that many of his patients were secreting food in their clothes while in the dining-room and eating it after going to their rooms. This particular feature caused him considerable trouble for a time after the treatment was begun. The bowels were kept open, as usual, with cathartics consisting very largely of Epsom and Rochelle salts. The treatment of serial seizures and of status epilepticus was carried out in the usual way—that is to say, by the use of elimination and restricted diet—but instead of

employing drugs formerly used to combat these conditions luminal was substituted; it became necessary, however, to use larger doses, as many as five grains of luminal every three hours.

There were 61 patients who had no convulsions after treatment was begun; 106 patients that had less than five convulsions while under treatment; 45 patients that had more than five convulsions. February 8, one patient died of lobar pneumonia; February 25, one patient died of mitral regurgitation; March 9, one patient died from status epilepticus.

Kirk believes that the use of luminal in the treatment of epileptic seizures is in the experimental stage, and not until several thousand cases have been treated over a period of years will we be able to determine its true value.

Summing up his experiences Kirk reaches these conclusions: There was immediate decrease in the number of seizures, a decrease in the severity of the seizures, many of them changing from grand mal to petit mal, decrease in the severity of furore and a shortening of the time of confused states, an improvement of the mental and physical health of all patients, fewer number of accidents, a general improvement of the moral tone of the wards, and a complete cessation of the seizures in a large number of cases. No deleterious effects were observed on the kidneys or stomach; circulation, temperature, and respiration were uninfluenced. Luminal is not a habit-producing drug and is not attended by any pleasurable or disagreeable sensation. In certain cases the drug is effective in twenty-four to forty-eight hours, in others not until a week or more has passed.

The purpose of Kirk's paper is to make a preliminary report on the effects of luminal on institution cases, which are obviously the most severe types of epilepsy to be seen. The reports made by neurologists are apt to cover milder types of epilepsy which are treated in private practice. The results are so gratifying that he desires to present them to the medical profession so that they may see for themselves just

what can be done with the severest types of epilepsy. Luminal gives promise of being the most effective and the least harmful of all drugs that have ever been used in the treatment of epilepsy, and will be a god-send to these poor, afflicted, pitiful, hopeless defectives.

Atmospheric Conditions and Efficiency.

The *Lancet* of April 30, 1921, in an editorial on this subject states that attention was recently drawn in the same journal to an interesting report of the Industrial Fatigue Research Board based upon the use of Leonard Hill's instrument, the kathermometer, in boot factories in England. Another report emanating from South Africa indicates that this instrument is also being used in other countries. The research reported upon by Orenstein and Ireland, working in the Rand gold mines, is the first effort known to us to estimate scientifically the effect of atmospheric conditions upon output and fatigue; for although Hill has insisted upon the importance of ventilation in relation to bodily activity, he has relied principally upon the increased strain thrown upon the circulation in secreting sweat in order to dissipate heat as the indication of reduced capacity for work.

The article under review opens with an excellent summary of physical fatigue and methods of estimating it, and of the work done by Haldane on respiration and Hill on ventilation. The authors devised two forms of ergometer: one was constructed to simulate closely hand-drilling, the type of work which causes the greatest amount of fatigue in gold-mining. In this apparatus blows of a hammer are communicated to a metal disc and, through its deflection, to a column of water which actuates a piston; the movements of the piston are recorded on a revolving drum. The second ergometer was essentially a band-brake dynamometer driven like a winch. Every revolution made by the operator represented so much work done for a certain net pull on the brake pulley. The observer had only to note and take periodical readings of a

revolution counter. Two native "boys," one a finely developed Xosa, aged forty, and the other a sturdy Basuto, aged thirty-five, were employed to work these instruments first on the surface and then in various places in the underground workings; meanwhile atmospheric conditions were observed by using the kata-thermometer, wet and dry, and taking ordinary wet- and dry-bulb temperatures. Observations were also made on the "boys" as to loss of weight, and skin and mouth temperatures. Conditions underground were observed as found, and also after stirring up the air, where oppressive, by a fan introduced for the purpose.

Many difficulties were experienced, as must always be the case when experimenting under industrial conditions. After due allowance made for these, the writers consider, a definite relation to be established between working efficiency and the dry, cooling power of the air. If efficiency is placed at 100, with a cooling power measured by the dry kata-thermometer of 6, it falls to only 50 when the cooling power falls to 1. The value of air movement alone was shown by use of the fan placed so as to blow a current of air over the "boys"; in one case an increase of 46 per cent of output, and in another of 32 per cent, was obtained. The relation between cooling power and output having been determined in this way, observations were made throughout a representative section of a mine. The cooling powers, estimated working efficiency, the number of men, and equivalent number at full efficiency were then ascertained, and the important conclusions arrived at that 21 per cent of output was being lost through inadequate cooling power. "This loss is loss of output and does not include the losses due to the increased morbidity which must surely follow on the excessive strain and fatigue associated with work in oppressive atmospheres; such losses would be hospital charges and cost of replacing sick men." We have here an instance of the importance to the economics of industry of studying the economics of humanity. Which costs most? The

loss of 21 per cent of output with its attendant increase of morbidity, or the cost of increasing the cooling power of air in the mines?

A laboratory worker reading this report may find much to criticize from the point of view of strict scientific control of observations; he may object on principle to the value of ergometers to measure output as being under the entire control of the operators; he may point to the influence of practice effect, and stress the difficulty of controlling the doings of the subjects outside working hours. Such things, however, must always be encountered under industrial conditions, and Orenstein and Ireland are fully alive to their importance. They are to be congratulated on having carried out a difficult and important research, and on having obtained definite and practical results. It is to be hoped that this work will be carried further, and that some of the more unusual methods of measuring output rather than using ergometers may be employed for estimating efficiency when trade revives. Some of the repetition work, so frequently referred to, should lend itself to hourly and daily computation, and so provide conditions for observation.

Misuse of Vaccines, Hay-fever Pollens, and Proteids.

In the *Pennsylvania Medical Journal* for April, 1921, ERSNER states that vaccines are valuable in otolaryngology and should be administered in small doses in the early stage so as to act as stimulants.

In chronic conditions large doses should be administered so as to stimulate leucocytosis.

In acute ear, nose and throat conditions the predominant cell found in the secretions is the polymorphonuclear leucocyte, while in the chronic conditions the mononuclear lymphocyte predominates. As the lymphocyte is increasing and the polymorphonuclear leucocyte is decreasing in the secretions, large doses of vaccines should be administered so as to stimulate leucocytosis.

Ersner says: Do not administer pollens

during the acute attack of hay-fever, as the patient at that time is already saturated with toxins, and upon inoculating him with pollens he often becomes worse.

Administration of pollens should begin about three months before the attack and cease six weeks before the attack is due.

During the attack he would suggest administering bacterial vaccines in small doses so as to stimulate an immunity against rhinitis, which is concomitant with hay-fever.

In asthma it is important to determine any underlying factors, such as nasal obstruction, cardiac and renal disease, and focal infection, and not depend exclusively upon the proteid tests and desensitization.

Chaulmoogra Oil in the Treatment of Tuberculosis.

In the *Journal of Laboratory and Clinical Medicine* for May, 1921, CULPEPPER and ABLESON state that a one-per-cent solution of the acid sodium salts of all the acid fractions of chaulmoogra oil they used were found to be non-toxic. Often the guinea-pigs used showed a marked increase in weight after the administration of heavy doses. One group suggested the presence of a vitamine or some element which has a marked influence on the weight of the pigs.

The peritoneal administration in the case of guinea-pigs was found to produce no undesirable effects. In this case peritoneal administration was found to be a method by which the salts may be absorbed by the body.

They found that the acid sodium salt of chaulmoogra oil has a specific bactericidal action on tubercle bacilli. Sweeney and Walker showed it was specific for the acid-fast group in a 1:100,000 dilution. They were only able to prove its bactericidal properties for tubercle bacilli in a dilution of 1:10,000.

Of the 12 pigs inoculated with tuberculosis and not treated, all died except one; of the 12 pigs treated only one died.

A marked difference in the pathologic findings between pigs which were and were

not treated was observed, the advantage being in favor of the treated pigs.

Treated pigs showed an average gain of 49 grammes over the ones not treated; the time factor being kept constant.

Auricular Fibrillation and Flutter.

The *British Medical Journal* of April 23, 1921, in an editorial on this subject, states that in the Oliver-Sharpey lectures, of which there is a complete report in the same issue of the *Journal*, Dr. Thomas Lewis described an attempt to ascertain the nature of certain grave disturbances of the human heart-beat. After years of patient investigation, aided by able and painstaking assistants, he is now confident that he has at last solved the riddle of the disorderly action of auricular fibrillation and the rapid and varying ventricular rate in auricular flutter. That this is of very great practical importance is obvious in view of the fact that auricular fibrillation is the most common cause and frequently the immediate cause of cardiac failure.

Fibrillation of the auricle was first recognized as a clinical entity by Sir James Mackenzie in 1890. It was he who appreciated the specific nature of its disorderly action and how it differed from the other arrhythmias, but he was not then in a position to state the essential nature of the happenings in the auricles. At first he was inclined to the view that the auricles were simply distended and paralyzed. Later he held that the auricles and ventricles contracted simultaneously in response to an irregular stimulation originating in the auriculoventricular node; the term nodal rhythm was employed to indicate this form of arrhythmia. This view in turn had to be abandoned when, in 1910, it was demonstrated by means of the electrocardiograph that the state of the auricles in these patients was identical with a condition produced experimentally even so far back as 1887, and termed fibrillation. In Dr. Lewis's lectures we have the final explanation of this important cardiac disorder.

Normally the contraction of the auricles

is a coördinated movement, occurring regularly. The stimulus originates in the sino-auricular node or pacemaker, and initiates a response in the auricles. Dr. Lewis shows that the action of the auricles is fundamentally different when flutter and when fibrillation occurs. The normal pacemaker is side-tracked, and a peculiar "circus movement" begins. In this movement the wave of contraction travels in a circular path, and constantly passes over the same ground. In order to form a clear conception of this mode of auricular activity it is essential to remember that, following every contraction of the auricular wall, the myocardium becomes refractory. This refractory stage persists for a varying time, and when it finally passes off the fibers are sensitive and responsive. When circus movement is present a wave of contraction is continuously circulating. The crest of this wave is always chasing its own wake across a gap of responsive tissue, and so long as there is this area of responsive muscle fiber in front of the advancing wave it continues to progress. It is obvious that this gap, both in its extent and also in the degree to which it has recovered its responsiveness, is of extreme importance. As Dr. Lewis indicates, if that gap could be closed, the circulating wave would come to an abrupt termination and permit the normal pacemaker to resume control of the heart.

Auricular flutter and fibrillation are both shown to be due to the same type of abnormal contraction of the auricles—namely, circus movement. There are, however, certain important differences in the action of the auricles in these two conditions. In fibrillation the rate is about 50 per cent higher than in flutter, and the action is not regular.

The explanation of these differences is the most fascinating section of the lectures. It is shown that the higher rate in fibrillation is due to the fact that the path of the circulating wave is shorter than in flutter. In many cases of flutter the "mother wave" encircles both venæ cavæ, while in fibrillation the ring of muscle fibers around the

opening of the superior vena cava alone may be involved.

The reason for the irregular action in fibrillation is to be found in the condition of the responsive gap already mentioned. With the very rapid rates of contraction in flutter and fibrillation there is a decrease in the duration and quality of the responsive phase, and a condition of partial refractoriness develops; this interferes with the progress of the advancing wave of contraction. In fibrillation this barrier becomes pronounced, and the rate of the onward movement of the wave varies, producing the disorderly rhythm of the ventricles so characteristic of fibrillation of the auricle.

Prolongation of the refractory state produces a corresponding reduction of the gap. This indicates the lines along which further investigations must take place, and we may look forward to the time when we shall be in possession of remedies which, by increasing the refractory period and closing the gap, will break the vicious circle underlying both flutter and fibrillation. The foundations for such further investigations have been well and truly laid.

The Responsibility of Intensive Treatment Methods to the Incidence of Early Neurosyphilis.

In the *American Journal of Syphilis* for April, 1921, FRASER concludes:

1. The responsibilities for the increasing incidence of early neurosyphilis rest with:

(a) The tendency to treat primary syphilis *en masse*.

(b) The method of working to a mechanical time-table.

(c) The blindfolded method of working to and for a negative Wassermann.

(d) Failure to interpret pathological findings in the light of the clinical picture.

(e) Losing sight of the importance of the central nervous system as regards the patient's future.

2. Modern early treatment fails in protecting the central nervous system by rap-

idly sterilizing the general systemic system and thus depriving the intrathecal system of its antibody supply.

3. The nervous system is invaded coincident with the generalization of the organism.

4. Nervous system involvement may be symptomatic or asymptomatic. In the absence of clinical signs a normal spinal fluid may indicate the successful overcoming of the organism by the central nervous system or the failure of the nervous system to react. It may also suggest that the general systemic circulation has been successfully sterilized before the intrathecal circulation was invaded. A pathologic spinal fluid may indicate implication or protective power. In the absence of symptoms we cannot accurately interpret the finding.

5. For the security of the future of the patient the invasion of the central nervous system should be taken for granted.

6. The occurrence of neurosyphilis is influenced by: (a) the patient's powers of resistance; (b) the natural resistance of the central nervous system and its inherent capacity for producing antibody; (c) the stage at which treatment is inaugurated; (d) the type of treatment employed; (e) the period over which treatment is carried out; (f) the type of organism responsible for the original infection. In this connection the question of a life cycle of the spirocheta pallida must be considered.

7. Great importance is attached to the value of clinical opinion, clinical observation, and clinical judgment. These should be correlated with careful interpretation of pathologic findings.

8. The importance of treating each particular case on its merits and as an individual, instead of treating him as one of a series, is emphasized.

9. Treatment should aim at conserving sufficient antibody for the requirements and protection of the central nervous system instead of defeating one's object by rapid sterilization of the systemic circulation, thereby leaving the defenceless nervous system to look after itself.

10. Antibody supply should be conserved

over a period of years. The value of intramine as a protection for the nervous tissues warrants its inclusion in any scheme of treatment. [The use of intramine has been vigorously condemned by other authors.—ED.]

Syphilis of the Heart.

In the *American Journal of Syphilis* for April, 1921, BROOKS states that syphilis involves the heart with great frequency both in early and in later stages of the infection.

Syphilitic lesions of the heart may involve the pericardium, the myocardium, the endocardium, and the conus arteriosus. The most frequent lesions apparently originate or progress about the terminals of the coronary system, and they are located for the greater part in the myocardium.

Any form or stage of syphilitic lesion except chancre may be found in the heart.

Cardiac involvement may appear very early in the infection, when it may terminate fatally; it may long remain quiescent and first become apparent late in the disease.

The signs and symptoms of syphilis of the heart are simply those resulting from the particular lesion present, and often develop few or no definite clinical characteristics aside from their association with a history of infection, the Wassermann reaction, and the relief of symptoms and signs under specific treatment.

Ordinary methods of cardiac treatment fail to give relief of the signs and symptoms of the disease unless combined with specific medication.

Syphilis of the heart may in most early cases be cured by specific treatment. Late cases can be much improved, entirely relieved, or perhaps cured by specific treatment.

Diagnosis rests chiefly on a history of infection, concomitant signs of it in other tissues, the positive Wassermann reaction, and notably on relief under specific treatment.

Successful treatment in any case rests on the recognition of the cause of the disease.

The Nutritive Value of Yeast in Bread.

In the *American Journal of Physiology* for May, 1921, HAWK, SMITH, and BERGEIM state that flour containing five per cent of yeast powder makes a palatable bread, much more nutritious than ordinary bread. The yeast supplements both the water-soluble B and the protein content of wheat flour. Yeast is thus a nutrient constituent of bread, and any increase in its amount up to quantities far in excess of those ordinarily used will improve the food value of the product.

Prevention of Acute Arsphenamine Reaction by Antianaphylaxis and Atropine.

In the *Journal of the American Medical Association* of May 7, 1921, BUSMAN states that the exact nature of nitritoid and gastrointestinal reactions to arsphenamine is undetermined. It seems not improbable that a variety of causes may act to produce a single syndrome, of which the acute reaction on the table and, in certain cases, the late gastrointestinal reaction may be phases of the same phenomena.

In the group of cases which he reports, repeated nitritoid crises, associated with repeated gastrointestinal reaction, persisted regardless of any controllable factor in the technique.

Repeated uncontrollable acute reactions are interpreted as personal idiosyncrasies of the patients to the drug.

The observation of Stokes on the value of atropine and of induced antianaphylaxis (Besredka technique) in the control of a persistent tendency to acute nitritoid crisis is confirmed.

It has been further found that a tendency to repeated late gastrointestinal reaction can also be controlled in a large number of cases by either method alone, or by a combination of the two methods.

Atropine is sometimes effective in doses less than 1/50 grain. It may fail entirely to affect reaction even in doses of 1/50 grain.

A combination of the use of atropine and

the induction of antianaphylaxis by dividing the dose of arsphenamine is more effective than the employment of either method alone.

A combination of the two methods may make possible the continuance of arsphenamine treatment in patients in whom repeated severe reaction would otherwise force its abandonment.

The Prevention of Diphtheria.

In the *New York State Journal of Medicine* for May, 1921, PARK states that the results of combined clinical and laboratory experience in testing the blood for antitoxin in case of diphtheria and in persons in contact with diphtheria have shown that only those individuals contract diphtheria who have no antitoxin or only a minute amount in their blood and tissues. Schick, in 1913, published a description of a simple clinical test, by which this can be accurately accomplished. The reaction depends on the local irritant action of minute quantities of diphtheria toxin when injected intracutaneously. If antitoxin is absent or present only in very small amounts, insufficient for protection from diphtheria, a positive reaction will appear in from twenty-four to forty-eight hours.

A positive reaction is characterized by a circumscribed area of redness and slight skin infiltration which measures from 1 to 2 centimeters in diameter. It usually appears in from twelve to forty-eight hours, but in a small percentage of cases it is delayed for as much as three days. It persists for five to fourteen days, or even longer, and on fading shows, as a rule, superficial scaling and a persistent brownish pigmentation.

Schick noticed that, in the older children and adults, a considerable percentage showed a protein reaction which had nothing to do with the specific toxicity of the toxin. In these cases, even when the mixture was overneutralized with antitoxin, this same pseudo-reaction developed. In most cases this reaction came on more promptly, covered a larger surface, was

more of the urticarial type, had as a rule a more reddened central area and a lighter surrounding zone, and disappeared within two to four days. Pigmentation is absent or slight, and superficial scaling is very rare. In a small percentage, however, the reaction persisted for a week or ten days, and it was very difficult in many of these, and impossible in some, to decide between a true and pseudo-reaction. When there was a combined reaction it was even harder to decide how much, if any, was due to the toxin and how much to the non-toxic protein, because the development of a true reaction in no way prevented the protein reaction.

The best practice, therefore, in older children and adults is to inject the toxin in the skin of one arm, and the toxin rendered non-toxic by heat, or antitoxin, in the other arm. In this way the amount of protein reaction can be noted, and it can generally be decided whether the reaction following the toxin is a simple, true reaction, a pseudo-reaction, or a combined reaction. Even after the eye has been thoroughly trained it is still wise to use the two injections when possible. On other occasions, when only the toxin injection is made, many cases which remain in doubt are treated as true reactions.

Park thinks it is apparent to all that the technique of the Schick reaction, although very simple, must be carried out with the greatest accuracy, or the results will be entirely misleading. If the toxin has been diluted and stored in a warm place, it may readily deteriorate, and, instead of giving 0.02 of a fatal dose (M.L.D.) only one-half that amount may be injected, and no toxic reaction will occur, and the misleading idea is given that the person has been shown to be immune. If the toxin is incorrectly diluted, and a large surplus of toxin is given, slight necrosis may develop at the point of injection. On two occasions when the test was extensively employed elsewhere in New York State this accident occurred, and some hundreds of people received undiluted toxin and developed very sore arms. The neutralized or heated toxin, used for

the pseudo-reaction, must also be prepared with care, and if possible should be from the same preparation of toxin.

To carry out the test it is essential to have an accurate syringe, with a sharp, but short-pointed, fine needle. Most persons prefer a needle with a length of one-quarter or one-half inch and a gauge of 26. The usual 1-Cc. Record syringe answers the purpose well. The Research Laboratory places a standard diphtheria toxin in capillary tubes in such amount that the contents of one tube added to 10 Cc. of water gives the required dilution. The dilution will keep in the ice-box with little deterioration for half a day. When bulk toxin alone is at hand, further dilutions are made in normal saline, of such strength that 0.2 Cc. contains 1/40 M. L. D. for the guinea-pig. Schick prefers a dose of 1/50 M. L. D. in 0.1 Cc. The results obtained by these two injections are similar, but the author's method allows more inaccuracy, for while it is desirable to give the dilution exactly 0.2 Cc., yet even such variations as 0.1 Cc. and 0.3 Cc. give fairly consistent results—the area of redness being smaller when 0.1 Cc. is given and larger when 0.3 Cc. is administered. There is one advantage in Schick's dilution in that it permits considerable deterioration of the toxin and still leaves it sufficiently strong to be effective. It is absolutely necessary to give it intracutaneously, so that the toxin will remain in the dense tissue and have time to exert its irritant action. The slightly raised white area, at the point of injection, is infallible evidence of the delivery intracutaneously of the diluted toxin. This amount is injected intracutaneously, on the flexor surface of the arm or forearm. The persistent pigmentation for several weeks which often results may make selection of the forearm in women slightly objectionable.

Though the intensity of the reaction varies in different individuals, a well-marked persisting redness indicates an almost complete absence of the antitoxin in the individual tested. Faint reactions lasting three to seven days point to the presence of very

small amounts of antitoxin, which are not sufficient, however, to certainly protect the individual against diphtheria, but are probably sufficient to protect from systemic intoxication. To prevent the appearance of the reaction, according to Schick, the presence in an individual of at least 1/30 unit of antitoxin per Cc. of blood is required. With the weaker dilution he employs 1/50 unit will prevent a reaction. According to V. Behring, even as little as 1/100 unit of antitoxin will protect against the disease in uncomplicated cases. In a child three years of age, weighing 35 pounds, he found that a subcutaneous injection of 10 units of antitoxin was sufficient to prevent the appearance of the Schick test when made twenty-four hours after the injection of antitoxin.

The Prevention of Puerperal Infection.

The *British Medical Journal* of May 14, 1921, in an editorial calls attention to an address on this subject in the same issue of the *Journal* by Bell, in which he brings forward strong arguments in favor of strict asepsis in the conduct of every parturition, and urges that there should be no interference with the labor if it is possible to avoid it. There is no need or justification for interference in a normal physiological labor, but as interference may become necessary at any stage of labor, should something abnormal develop, asepsis is always necessary to prevent infection. Infective organisms are almost invariably conveyed into the vagina and uterus by the attendant's hands or instruments. If sterile rubber gloves are not used, or instruments are not efficiently sterilized, the patient may be infected by the attendant directly; but even if his hands and instruments are sterile, the attendant may carry infection into the uterus from the septic and pathogenic organisms always present around the entrance of the genital passage, if the skin has not been rendered temporarily sterile. Sometimes the patient has already been examined by the nurse, without aseptic precau-

tions, before the doctor arrives. This is dangerous and unjustifiable, and should be absolutely forbidden.

Germs may be described as autogenetic if derived from the patient's own tissues, but the infection cannot properly be called autogenetic if these germs are carried up to the placental wound by the attendant. Perineal and vulval lacerations may also be infected by the organisms of the patient's skin. This may be prevented by immediately and carefully closing all such lacerations with accurately placed sutures. Infections from lacerations usually lead to local cellulitis.

As regards the feasibility of conducting a normal labor without vaginal examination, it is a fact that if a woman has been examined during her pregnancy by the attending practitioner, he can find out everything else he wishes to know by abdominal palpation, except the progressive dilatation of the cervix and descent of the presenting part, and this information he can obtain by rectal examination, as Holland has suggested. Sterilized rubber gloves must be worn as a "point of honor" in all such examinations, and sterile overalls must be worn throughout the attendance. Too frequent use of forceps is condemned by all experts, and Bell strongly urges that "the practice of using forceps indiscriminately, without medical need, to save the mother further pain, or to appease a husband's anxiety, or to save the time of the practitioner, should cease." In this view he is fully justified.

The main question to be decided is how far the practitioner or midwife should go in the preparation of the patient to safeguard her against infection. Should every parturient woman be prepared as if for an operation which may involve vulval, vaginal, and cervical lacerations and an intrauterine wound? Theoretically, this would entirely prevent infection, if effectively carried out, by an attendant who realizes his own responsibilities as the operator, and it is found easy to carry it out in hospital practice. Though rectal organisms do not infect a parturient woman unless through the

contaminated hands of the attendant, the anal region must be regarded as a source of danger, and care should be taken to have the rectum previously emptied, as in a pelvic operation. The skin round both the anal and genital areas should be prepared precisely as if a pelvic operation were about to be performed, by a sitz bath in a weak antiseptic solution, and the application of a 2-per-cent iodine solution, or other usual antiseptic. To complete the preparation, in all cases in which interference has become necessary, Bell says "no makeshift (as regards asepsis) must satisfy the practitioner," and he therefore succinctly says, "The vulva must be shaved," and later on says: "All this ritual is absolutely necessary." There should be no difficulty in doing this shaving, under anesthesia, previous to the use of forceps or versions, and in most cases it can be done early in labor without objection being raised, and without anesthesia, previous to vaginal examinations, if these have become necessary, for it must be admitted that any interference with a labor, normal or abnormal, should be regarded as a surgical operation, as Bonney has recently insisted. The more complete the aseptic ritual is the safer will be the labor, for it is probably true that the more casual or unpremeditated the "interference," such as the passage of a catheter, the more likely is it to be associated with an imperfect asepsis.

Putting aside, however, all controversial points, let the profession concentrate on the two methods now agreed upon as the most likely to prevent puerperal infection and mortality. These methods are not in dispute and have emerged from much experience and discussion of the subject. They may briefly be stated to be: (1) There should be no vaginal examination or other interference during labor unless absolutely unavoidable; and (2) there must be as complete an aseptic preparation of the patient, of the attendants, and of the obstetric paraphernalia, at every confinement, as would be appropriate to a pelvic operation. Cannot midwives, and practitioners who attend midwifery throughout the country, be per-

sueded to adopt these principles of prophylaxis in their entirety, and in every confinement, and so save the 1000 lives of their countrywomen which are annually sacrificed by unguarded interference and imperfect asepsis?

Recent Advances in the Treatment of Epilepsy.

In the *Chicago Medical Recorder* for May, 1921, VAN NUYS states that of late he has used luminal and luminal sodium rather extensively at the Indiana Village for Epileptics.

His attention was first called to the use of luminal in epilepsy by Dr. Francis X. Dercum's paper in the *THERAPEUTIC GAZETTE* of September 15, 1919, and it has been given in the dosage and manner suggested by him except that he has not in any case used the drug in combination with bromides. Until February, 1920, he was unable to procure luminal except in very small quantity, and even now the supply is limited. At the present time about two hundred patients are receiving this treatment, some having taken the drug daily for eight months. The dosage used is one and one-half grains of luminal or two grains of luminal sodium at bedtime each night. A few patients receive this dosage every other night, and in rare instances a similar dose is given night and morning. In no case has a larger dose been given, or more than two doses in one day. He has not used luminal long enough to arrive at conclusions in regard to the benefits to be derived from its use. The following statements may be made:

Erythematous rashes with edema of the lower eyelids occurred in two cases. A few patients complained of drowsiness throughout the day. This was relieved by giving a dose only every other day.

In each case the number of seizures has been reduced, in some cases considerably.

In many cases a reduction in the frequency of seizures was noted after the first dose.

In two cases no decrease in the frequency

of seizures was noted after two weeks' treatment. Treatment was withdrawn for two weeks and begun again, when an immediate decrease in the frequency of seizures was noted.

Many patients who formerly were restless and disturbed at night, who suffered from bad dreams and awoke unrefreshed, say that now they sleep soundly and feel better in the morning.

Most of these patients are brighter and more cheerful. Many are able to work who could not work before. Those who did work are doing better work.

In some instances patients who are accustomed to periods of excitement at their seizure periods do not now so react. Other patients pass through mild periods of excitement without seizures.

In no case has there been a complete cessation of seizures as the result of the administration of luminal.

When luminal has been withdrawn seizures have recurred at once.

Glycemia and Glycosuria.

In the *Lancet* of May 21, 1921, GRAHAM, in his third Goulstonian Lecture on this subject, states that the diet which he now uses has been modified in various ways as the result of reading Allen's work and further experience in treating patients. The general routine which he now employs is as follows:

The patient is allowed his ordinary diet on the first day on which he enters the hospital, with the addition of 600 Cc. of milk and 50 grammes of bread, unless he is on the verge of coma. The amount of sugar which is passed in this portion of the day is estimated and gives a rough idea of the severity of the disease. Two days' starvation are then given, tea, coffee, meat extract, and as much water as is desired being allowed. Whether the urine is sugar-free or not, the patient is not allowed to fast more than two days at a time. On the third and fourth days the egg and vegetable diet of five eggs, 50 grammes of butter, and 300 grammes of greens is given. If the patient

is still passing sugar two more fast days are given, and this is alternated, as a rule, until the urine is sugar-free or the attempt to get it sugar-free has to be abandoned. If the patient is sugar-free 50 grammes of meat are added to the midday meal for two days. On the seventh and eighth days 50 grammes of ham are added for tea and one egg is taken away. On the ninth and tenth days 50 grammes of bacon are given at breakfast and one egg is taken away. If the patient passes traces of sugar on two successive days he is put back to the bottom of the ladder and made to climb up again. If no sugar is passed 100 Cc. of milk are given on the eleventh and twelfth days—that is equal to 4 grammes of sugar. This makes the tea and coffee more palatable. If no sugar is passed 15 grammes of bread are given in two doses. On the thirteenth and fourteenth days another 15 grammes of bread are added, so that the patient gets four doses of 8 grammes of bread at four meals. It is most important to divide the carbohydrate among as many meals as possible so as to spread the effect of the dose of sugar on the level of the blood sugar as much as possible. If the patient is doing well the bread is increased to 45 grammes, which is enough to keep most patients comfortable. If the amount of aceto-acetic acid is quite small, a mere trace, the butter is then increased in two doses of 25 grammes, watching the effect on the aceto-acetic acid reaction and sugar.

This makes a diet of: carbohydrates, 41 grammes; protein, 35.5 grammes; fats, 167.5 grammes; a total calories, 1865, which for a man of 60 kilos is 31 per kilo. The protein is 0.57 per kilo. It is quite true that this represents a considerable degree of under-nutrition, but it seems to be quite enough to enable weight to be maintained and life to be enjoyed. He thinks that it is wiser not to try to test the tolerance any further at this stage, but at the end of each month, if all is well, the amount of bread can be increased by another 15 or 30 grammes if it can be tolerated. This diet is enough to live on and do light work.

If, as often happens, the patient passes sugar when he is tested with 15 or 30 grammes of bread, he is put back and kept at a lower level for a further period.

The addition of alcohol to the diet in these severe cases, as recommended by Leyton, is worth a trial, as he has found that alcohol can be given without causing the excretion of sugar. The equivalent of two ounces of absolute alcohol can be used in this way. The agar-agar and bran biscuits recommended by Allen are of great assistance to the patient, as they provide a medium for eating the butter.

The ladder diet, which has developed from the original egg and vegetable day of von Noorden, differs from Allen's diet in certain important details. The fast is not continued until the patient ceases to pass sugar, as he finds that the patient stands the alternations of egg and vegetable days and fast days better than the prolonged fast. Allen has occasionally found that elderly people are upset by the fast and may have to be fed on the third and fourth days. The routine alternation which he uses may explain why any ill-effects have not been noticed. Allen breaks the fast with increasing amounts of vegetables and tests the carbohydrate tolerance on a diet which contains very little protein and fat. Later he increases the protein to 1.5 grammes per kilo, and last of all the fat. This scheme is more elaborate than the ladder plan, but it is more complicated for ordinary people to carry out.

The question as to whether it is right to add carbohydrates first and thus test the carbohydrate tolerance, and then add protein, is a very important one and is opposed to Graham's plan. Allen's recent work on the conversion of a mild diabetes into a severe one is very important, as he found that it was much easier to lower the sugar tolerance of a dog by overfeeding with sugar than with starch, and with starch than with protein. Thus the recent work is opposed to the principle of adding carbohydrate first. The ladder plan, which was based on the old idea of avoidance of carbohydrates, appears therefore to be more

scientific than Allen's plan. The danger of giving fat is twofold: (1) It may cause an increased formation of acetone bodies, and the fat intake must be kept low, especially in severe cases; (2) fat has a very high caloric value, and by increasing the fat too much, it is easy to break the first principle of the treatment and overfeed the patient. It is very difficult to determine whether the results are better with one plan or the other.

It has been suggested that one reason why the period of starvation produces such good results is that the absence of food allowed the pancreas to rest its external secretion and so improved the internal secretion. Allen supports this suggestion, as he found that ligation of the pancreatic duct of a partially depancreatized dog which was excreting sugar caused the cessation or diminution of glycosuria. This evidence was very suggestive, but it has been shown by Homans that the exclusion of the pancreatic juice from the intestines rendered it difficult for the animal to digest its food properly, and it lost weight. Thus tying the pancreatic duct causes under-nutrition, and it is the under-nutrition, not the resting of the pancreas, which prevents the glycosuria.

The treatment of the patient who passes sugar as soon as food is given, in spite of repeated fasts, is very difficult. Unless all hope is abandoned of improving the condition it is better to persevere with a very small amount of vegetables, protein, and fat, adding a certain amount of alcohol. The outlook in a long-standing case of this severity is very bad, but in an early acute case the treatment should be persevered with for a considerable time, as the acute case sometimes makes a surprisingly good recovery.

The question of the effect of exercise on the diabetic is a very important one, and Allen has devoted a good deal of attention to it. It has been shown that exercise causes a diminution of glycosuria and hyperglycemia in mild and perhaps moderately severe cases. In more severe cases, however, this is not the case, and sometimes

an increase of glycosuria and hyperglycemia occurs. Allen is strongly of the opinion that exercise is of great benefit to the general health of the patient.

Graham's experience has caused him to express himself rather differently, and to draw a very sharp distinction between the treatment of the acute stage and of the convalescent stage. The practice at St. Bartholomew's for some years has been to keep the patient strictly in bed so long as the sugar tolerance was being tested. This procedure was started originally by the sister of the ward, as she realized that it was impossible to keep a watch over the patients when they were up and about in a general ward. Even when they are in bed they still occasionally acquire carbohydrate surreptitiously. Although the practice was started for this reason, it was soon realized that when the patient was on a diet of very low caloric value it was much better that he should be at rest in bed. The work of Joffe, Poulton and Ryffel on the metabolism of a man who only took 2000 calories per day, or 34 calories per kilo, showed that if the man was taking exercise his energy consumption was just as great as that of a well-fed man, but when he was lying still his basal metabolism was very much less than that of a well-fed man.

If the diabetic learns to lie still in bed he will have a much lower basal metabolism than if he is up, and therefore will be able to live in comparative comfort on a low caloric diet. Last autumn, as the result of seeing the three acute cases which he describes in Lecture II, Graham was more firmly convinced of the value of the method for another reason. If the hypothesis is correct that in an acute case serious damage has been done to the islands of Langerhans, it seems reasonable to suggest that the patient should be treated as if he had had a severe illness. Whether it is possible to influence the course of the disease in any way by keeping the patient at rest no one can yet say, but the practice is justifiable on general principles.

Therefore, if the patient is seen soon after the onset of symptoms he should be

kept in bed for a considerable time. His practice now is to keep the patient in bed for four weeks after he is able to take a diet of reasonable caloric value with about 40 grammes of sugar, if that result can be attained. During these four weeks no attempt is made to increase the diet at all. If he is not able to take so high a diet he should be kept at a level at which he does not have to pass sugar for the same period. After that time has elapsed he is allowed to get up by degrees. If he remains sugar-free he should gradually take on more exercise, but should avoid hard work. This advice is easy to give, but very difficult for the laboring classes to carry out. It is important to impress on the patients who have to live on a diet of low caloric value that they must rest properly whenever they are able. When they are convalescent, exercise and fresh air is good for them, as for ordinary people, and a general improvement in health may improve the sugar tolerance.

Treatment and Management of Lobar Pneumonia.

In the *Medical Record* of June 4, 1921, HERRICK states that digitalis in moderate doses in pneumonia can certainly do no harm. He believes there is no convincing evidence that in the ordinary case it does much good. The fact that digitalis influences the electrocardiographic record in pneumonia is not evidence of benefit. When chronic myocardial weakness or auricular fibrillation exists, there is no question of its advantage. He confesses to the use of small doses of the tincture as a routine, but without being convinced of its profit. He believes heavy doses in cases with normal hearts are unwise. In ten years he wonders if we shall be hearing so much of the use of digitalis in pneumonia.

Stimulants are a slender reed. The use of caffeine is often injudicious. A cup of strong coffee contains about three grains of caffeine. Let the therapist himself take this allowance of the drug at intervals of three hours and know the sleepless, restless, irritable state resulting. Far too often one

sees the simultaneous administration of large amounts of caffeine as a stimulant and of morphine to overcome the wakefulness and irritation resulting from the caffeine. Such therapy is injudicious, if not vicious. Caffeine may be used best in the form of strong coffee, not too frequently, and only in cases inclined to be somnolent, never in the restless, agitated, sleepless types.

Strychnine seems of little avail. The diffusible stimulants—camphor and ether, whisky, camphor in oil, etc.—are of little use. In some work done by C. C. Lieb and the writer it was shown that these and kindred substances owed their action to strong irritation of the endings of sensory nerves and not to any direct effect on the circulation. When injected into a limb, the afferent sensory tracts of which had been severed, no change in pulse-rate or blood-pressure followed.

Pituitrin may be life-saving in cases with abdominal distention from toxic paresis of the gastrointestinal tube. It is best given in conjunction with a turpentine enema, and injected deeply into the muscles.

Little profit would seem to be expected from atropine. Possibly the reduction in secretion of the glands in the mucosa of the respiratory tract has a slight value in cases with too much bronchial exudate. It certainly cannot influence the transudate, which is the outstanding fact in pulmonary edema, for which it is so often used. The use of sufficient atropine to paralyze the vagus endings is surely dangerous. Simultaneous employment of digitalis, a drug that increases the activity of the vagus, and of atropine, a drug paralyzing vagus terminations, is a therapeutic contradiction which, like the concomitant use of caffeine and morphine, needs only to be mentioned.

In cases of very low blood-pressure and impending collapse of the vasomotor system, adrenalin, given in small doses of three to five minims at frequent intervals, may benefit. The administration of adrenalin in oil, according to the method of Dr. H. R. Miller of New York, by which slow absorption is assured, is promising. When-

ever there is a tendency toward edema of the lungs, adrenalin seems to be contraindicated.

The Action of Digitalis and Atropine on the Peripheral Blood-pressure.

In the *Lancet* of May 21, 1921, HARRIS, in concluding his article on this subject, states that under the influence of digitalis the diastolic pressure becomes lower and incidentally the systolic, whilst pulse pressure rises. The decline of the diastolic pressure is not due to a diminished output of the heart—the contrary is the case. The low diastolic pressure is not due to dilatation of the arteries. The conclusion is that the blood stream leaves the arterial circulation at a greater rate than under normal conditions. The corollary to this conclusion is that under digitalis the heart contains at the beginning of the systole a greater amount of blood than before. The quickening of the pulse observed in the later stages of digitalis is due to the fact that in a shorter time than normal the intracardiac pressure is sufficiently high to excite contraction.

The Effect of Tobacco on Man.

In the *New York Medical Journal* of June 1, 1921, GIES, KAHN and LIMERICK state it is significant that no constant relation exists between the amount of pleasure derivable from a given specimen of tobacco and its nicotine content or the extent of any consequent physiological effect. The preference of the tobacco smoker does not persist in the direction of tobacco containing the greatest amount of nicotine. Statistics prove that the common drift of tobacco smokers is toward the mildest form of tobacco—from the cigar to the cigarette. This voluntary drift toward the less potent is the exact reverse of what is characteristic of drug addicts. It can thus be seen that tobacco, whether mild or strong, does aid in the adjustment of the ego to its environment, and it is obvious that it does so through its action on the psychic and adrenal mechanisms.

Tobacco does not cause disease of either mind or body. It has been asserted by some that the immoderate use of the plant bears a causal relation to arteriosclerosis, but no one has yet presented proof that it does; the theory on which the assertion rests is implausible. The condition commonly termed smoker's heart is often due to myocarditis associated with gonorrhea, syphilis, rheumatism, tonsillitis, pyorrhea alveolaris, dental abscesses, and other causes.

It may be urged that since it is certain that the excessive use of tobacco does occasionally affect the vascular system and neuromuscular coördination, the plant must necessarily be an economic menace. The answer to this possible contention is quite simple: a thing is an economic asset or liability, according to the sum of its effect on the race. It is conceded that education is by far the greatest of all economic assets. Education has been acquired at the expense of some visual impairment: the eye strain incident to reading the printed word has made it necessary for many to resort to glasses in order to correct the optical ill adjustment. Again, ill adjustment to the erect posture makes it necessary for many persons to wear a truss. The right-minded do not advocate closing the schools nor do they oppose the manufacture of trusses. Others may contend that the attractiveness of tobacco for the female sex constitutes a menace to future generations.

Tobacco has no special attractiveness for the female of the species. The specific antidotal mechanism of the body to tobacco will continue greatest on the male side in conformity with hereditary forces. It is the males of all the races of the earth that exhibit the greatest fondness for tobacco. The same impulse that caused some women of yesterday to wear the deforming corset and others of today to expose their legs to wintry winds will prompt a few to affect a fondness for tobacco until another and more fetching stratagem of sex attraction has been thought of.

The habitually moderate use of tobacco is not harmful to adults.

The moderate use of tobacco proves distinctly helpful to certain adult types.

The habitually excessive use of tobacco may prove harmful to certain individuals. But the same holds equally true of all foods.

The excessive use of tobacco may prove harmful in certain neurovascular disorders.

The habitual use of tobacco by juveniles is harmful.

Diabetic Acidosis.

In the *Medical Record* of June 4, 1921, EDGAR states that if the patient is not in coma and is able to take food by mouth he immediately introduces into the stomach one gramme of carbohydrate per kilogramme of body weight in the form of orange juice or oatmeal gruel. This is best divided into four doses, and administered during the twenty-four hours. In these cases the introduction of fluid is essential. His method is to see that the patient takes by mouth at least three thousand cubic centimeters of either warm water, tea, or coffee in the twenty-four hours. A high colonic irrigation is given, consisting of one drachm of sodium bicarbonate to the quart of water. This is repeated daily till symptoms of acid poisoning have been conquered. No other food should be allowed during this treatment. If the patient presents evidence of great fatigue, poor, thready pulse, alcohol should be administered well diluted, an adult taking as much as four ounces during the course of the day.

In those patients who are in a semicomatose condition, nauseated and dyspneic, he immediately introduces high up into the colon six ounces of the following: glucose 5 per cent, sodium bicarbonate 2 per cent, dissolved in six ounces of saline solution. If the patient is a large individual he increases this to eight ounces. This to be retained. If conditions are such that active stimulation is necessary one ounce of whisky may be added.

To maintain arterial tension 500 to 1000 Cc. of sterile physiological saline solution is introduced into the median basilic vein—the quantity necessary depending, of course, on

the age and size of the patient. In the severe type, in which very heroic measures must be adopted, he infuses with a 2-per-cent glucose solution to which nine-tenths-per cent sodium bicarbonate is added. This procedure is repeated the next day if necessary.

In patients suffering from an accumulation of betaoxybutyric acid, fluid depletion of body is evident, accompanied with great loss of weight. Incidentally it may be stated that the body alkali reserve is exhausted or nearly so: which is the natural course of events in that the body has been called upon to neutralize the acid formed. Thus the indication is apparent to renew or introduce sufficient quantity of a base to bring back or renew preacidic alkalinity.

Many followers of the starvation theory do not believe that sodium bicarbonate is capable of influencing the acid condition. Edgar feels that their opinions have been too hurriedly arrived at, as a result of the administration of either too large a quantity or not enough.

Asthma.

In the *Lancet* of May 28, 1921, HURST states that he has found that the irritability of the bronchial center can be to some extent reduced by giving between 3 and 5 grains of caffeine, with double the dose of antipyrin, when the patient feels slightly asthmatic and fears that an attack will develop later, as, for instance, immediately after lunch and dinner or on going to bed.

When asthmatic attacks are caused by food proteins all that is generally necessary is to exclude from the diet the food to which the patient is found to be most sensitive by the cutaneous test. Long abstention probably results in desensitization. If eczema or urticaria is present it often disappears at the same time. Desensitization does not follow injection of the proteins or feeding in slowly increased quantities of the food. Desensitization to pollen can almost invariably be brought about by the subcutaneous injection of progressively larger doses of the pollen extract during the

weeks preceding each hay-fever and hay-asthma season.

A patient can often free himself from asthma by simply avoiding any animal to which he has been shown to be sensitive, or in the case of feathers by avoiding feather pillows, mattresses, and upholstery. When an asthmatic is sensitive to horse dandruff in a dilution of 1 in 10,000 or more desensitization is necessary, as the dust of city streets contains sufficient of the protein to cause attacks. In such cases, and whenever avoidance of the animals is impossible or does not relieve the asthma, desensitization should be undertaken with the specific proteins. Nothing but specific treatment is of any use; thus an individual who is sensitive to horse serum can be desensitized with the serum if it is necessary to give him some antitoxin, but this has no effect on his asthma, even if he happens to be also sensitive to horse-dandruff proteins. A large proportion of cases are relieved; at the same time the skin reaction disappears or is greatly reduced in intensity.

Idiopathy to bacterial toxins can generally be overcome by vaccination in the ordinary way with organisms isolated from the patient's bronchial secretion or material obtained from other infective foci. In determining which organisms are most important the cutaneous reactions give some help, but even if no reaction is obtained an autogenous vaccine may prove very useful in curing chronic bronchitis or rhinitis which has acted as a reflex cause of asthma. The reaction is generally negligible if the injection is made at night and the patient takes 10 or 15 grains of aspirin at the same time. Lastly, the daily life of each patient should be investigated in every detail in an attempt to find some special toxic idiopathy other than the familiar ones already described, which may be in part responsible for the asthma.

Bronchitis should be treated by autogenous vaccines and small doses of iodides taken for long periods. A careful examination of the nose should be made and any obvious source of irritation removed, but no operation should be performed unless it

is very clearly indicated, as Hurst has seen several cases aggravated by such operations, and one of the worst cases he has ever seen was a man of fifty who had his first attack of asthma immediately after a hypertrophied turbinal had been removed. He has seen several cases in which mere cauterization of a sensitive point on the septum in an apparently normal nose, as advocated by Francis, has produced marked improvement, though rarely, if ever, complete disappearance of all attacks. In many cases an autogenous vaccine prepared from the nasal secretion will do away with the need for local treatment by relieving the congestion which is secondary to infection, and in any case it is a useful preliminary measure in order to diminish the severe reaction which occasionally follows an operation. Apart from the Friedlander bacillus, Dr. Eyre finds that the *B. septus* isolated from the nasal secretion, and pneumococci, *M. catarrhalis* and streptococci from the nasal and bronchial secretion, are the organisms most frequently found in the rhinitis and bronchitis associated with asthma.

The intestinal-bronchial reflex comes almost entirely from the pelvic colon and rectum, and regular habits and exercises to overcome difficult defecation are generally sufficient to keep it in check. Aperients should be avoided as far as possible, but in some cases a small weekly dose of infusion of senna is needed to prevent a fecal accumulation from forming.

An attack of asthma can most readily be cut short by the subcutaneous injection of adrenalin. The most efficacious dose is very much smaller than that generally given. In many cases a single minim of 1-in-1000 adrenalin chloride is enough, more than two minims being rarely required. But the injection should be given at the beginning of an attack, directly a patient wakes in the night, for instance, and not half an hour or an hour later when it has reached its full development. The relief is so immediate that the patient often falls asleep within five minutes of waking in an attack. Such small doses give rise to no unpleasant sensations, such as frequently follow the injection

of three or more minims, and the blood-pressure does not rise at all. Consequently the treatment can be continued for long periods without any fear of ultimately causing arteriosclerosis. It is the only form of injection which a patient should be allowed to use on himself; if he has to depend on some one else giving the injection he will rarely receive it at the right moment.

For slight attacks and for the feeling of slight dyspnea which may persist throughout the day when severe attacks occur at night, atropine and cocaine may be used with an atomizer.

No patient should be allowed to use any of the numerous powders employed by inhaling the fumes produced when they are burnt, as they invariably aggravate any bronchitis which may be present, and actually give rise to bronchitis in patients who have hitherto been free from it. Hurst has seen several patients who have only recovered from a prolonged attack of asthma, persisting for weeks or months, after they had been persuaded to spend their nights sleeping in an easy chair instead of lying down in bed. Lastly, he emphasizes the fact that these remarks on the treatment of the attack should not make us forget that our chief aim must be to devise such a course of action for the patient that he will eventually have no attacks to treat.

Chronic Nephritis.

In the *American Journal of the Medical Sciences* of June, 1921, RINGER states that he has seen patients fed on lithia tablets, nephritic pills, diuretics, alkali and what not. We should realize what these patients need at this stage. The circulation is good, the kidney function is good—why disturb them? Why give them alkali to excrete and thus throw extra burdens on the kidneys? Why give them diuretics and drive an already tired organ? The more the patient is let alone the better.

We are not dealing with people who are sick but with people who suffer a physical handicap. Our chief duty now lies in preventing the patient from doing things which

might hasten a breakdown. If he develops slight edema of the ankles, or if the blood-pressure runs up too high, it may be advisable to place him in bed for a week or two. It is remarkable what a tremendous effect this has on the patient. Ringer has seen cases with blood-pressure of 220 and 240 come down to 160 and 180 after spending only one week in bed. The use of nitrites in these cases is of absolutely no use, except if the patient has anginal attacks. In that case he gives him 1 grain of sodium nitrite or 1-50th grain of nitroglycerin. The use of benzyl-benzoate, recently advised by Macht, Ringer says, is of no use whatsoever.

Before prescribing a drug to a patient with nephritis it is advisable to know what one wants to accomplish, what symptom or group of symptoms one wishes to eliminate, and to watch for the effect. If we do get a response, stop the drug as soon as the results sought for are accomplished. If we do not get any improvement, continuing the drug will not help but may introduce serious complications. Ringer recalls two cases, one in private practice and one in the hospital that he was called in to see. Both patients had high blood-pressure, with albuminuria and casts. The history of both was that for the past few days they had been getting more and more stuporous, until finally they could hardly be aroused. The diagnosis of uremia was made in both cases. From both the examination and the general history one could hardly come to any other conclusion. On examining the blood he found its chemical composition normal, save for a slight increase in the uric acid; but as patients with uremia never have normal urea nitrogen, the diagnosis of uremia had to be abandoned. It was then brought to light that both patients had been taking chloral hydrate for several weeks. He felt convinced that the chloral hydrate was responsible for the complications. Several days' abstinence from the drug cleared up both cases. Both patients are alive today.

We must ever be mindful of the fact that most drugs have to be excreted from the body and that it is done very largely by the kidneys. Therefore, it is important

when drugs have to be used to select only those that cannot possibly aggravate matters and introduce complications.

There are a great many patients who believe that the "albuminuria" or the "high blood-pressure" constitutes their illness, and they expect the physician to "cure" them of it. A fifteen minutes' talk, in which the whole matter is explained to the patient and brought within his mental grasp, will save a lot of trouble in the end.

Success in the treatment of such a condition depends not upon drugs or medicine but upon teaching the patient to recognize his limitations, to save himself every bit of unnecessary exertion, to readjust his activities, to regulate and moderate his diet, to spend as much of his time at rest as possible. In other words, to teach the patient to live within his physiological means.

Patients who are classified as belonging to Group C, in which the patient has fairly severe subjective symptoms and the objective findings of nephritis are quite marked, are mostly ambulatory, still engaged in gainful occupations, but who begin to find it a great burden to get through the day's work. They suffer primarily from symptoms affecting the cardiovascular and nervous systems. As far as the kidney function is concerned, there is still perfect elimination of all the known products of metabolism, though in the later stages there may begin evidences of delayed excretion.

The treatment is entirely symptomatic. Headaches, dizziness, palpitation of the heart and shortness of breath form the chief complaints of most of the patients in this stage. Seldom will these symptoms be manifested in patients who have a blood-pressure of less than 220 or 240. When this does occur the patient's myocardium is usually at fault. Obesity may also frequently be responsible for it when accompanied by a not too strong myocardium.

The best and most efficient remedy, and one which seldom fails, is one or two weeks' vacation in bed, with a dose of bromide, 15 grains three times a day. During this period, Ringer restricts the diet to a low protein, low salt, and low purins—

i.e., he cuts out meat soups, tea, and coffee. In addition, he also restricts the absolute amount of food. If the headaches and dizziness are very severe the use of cinchophen tablets, in 7-grain doses, two or three times a day, is frequently of great benefit. Tolysin in 5-grain doses may also be used. The latter has the advantage of being tasteless and does not tend to produce gastric distress. Phlebotomy and withdrawal of 300 to 500 Cc. of blood is frequently followed by relief. He has had several patients who suffered such intense headaches that nothing but morphine could relieve them. The performing of a lumbar puncture and withdrawal of some of the spinal fluid plus a venesection brought them considerable relief, and they were able to get along without drugs for a long time afterward.

Staying in bed, and freedom from excitement and business worries, have positively the most soothing effect on a patient. He gets a new lease of life and feels better for months afterward.

Goitre.

In the *Boston Medical and Surgical Journal* of June 30, 1921, STANTON states that the mild cases of toxic goitre sometimes yield to long periods of rest and simple life. Those with well-established symptoms, particularly the exophthalmic cases, are proper subjects for surgery. Any mild toxic case may become toxic years and years after the onset of the disease, and it is far better to operate early than to wait until serious organic changes have taken place in the vital organs of the body, particularly in the muscular structure of the heart.

The exophthalmic cases are much more frequent in the female than in the male, and appear most frequently at about thirty years of age.

All operative cases should be given a period of rest in bed, with ice applied to the neck and freedom from all psychic disturbance. Small doses of morphia and belladonna should be taken to slow down the metabolism. Digitalis is a useful drug to

lessen the action of the heart, which is so annoying at times. The slower the heart and the lower the basal metabolism, the safer the operative risk.

If the pulse is continuously under 120 and the basal metabolism is under +30, it is safe to perform a radical operation. If the pulse is continuously over 120 and the basal metabolism over +30, it is far better to do a preliminary ligation or use injections of boiling water in order to bring the patient into the zone of safety.

When one has to decide what to do in the individual case, he must use his surgical sense. The extremely toxic patient, rapidly losing weight, is a poor surgical risk. The two-stage operation has decreased the operative mortality in many other diseases, and will in the future lower the mortality of this disease.

The x-ray has been of doubtful value in the treatment of toxic goitre. Hydrobromide of quinine is of little, if any, value. The improvement sometimes seen during its administration may be explained by the natural improvement evident from time to time in the course of the disease. This particular one seems to progress in cycles, similar to pernicious anemia.

Stanton has found injections of boiling water, as advocated by Porter of Fort Wayne, Indiana, of great value in bringing six cases of the very toxic exophthalmic type into the zone of safety, so that he was able to do a radical operation at one sitting.

The technique is very simple: freeze or cocaine the skin over either lobe, and with a hot syringe filled with boiling water inject from 2 to 6 Cc., according to the size of the gland. This destroys a certain amount of the gland and lowers the amount of toxic material poured into the blood stream. Four to six injections usually suffice.

Primary ligation should be done in the extremely toxic cases under local anesthesia, ligating one side at a time, and including nerves, blood-vessels, and lymphatics, as advocated by Charles Mayo. From one to six months should elapse before a resection is done, depending on the rate of improvement after the primary ligation.

By a process of slow evolution in the surgical treatment of hyperthyroidism, Stanton has learned that the failure to cure many cases in the past was due to the removal of too little of the gland. From two-thirds to five-sixths of the gland should be removed, according to the toxicity of the case. If the greater part of both lobes is removed and a thin layer left with the posterior capsule, no damage will be done to the parathyroid, and sufficient gland will be left to maintain normal metabolism.

No isthmus should be left, for it is almost sure to develop and produce a noticeable and troublesome deformity.

The operation itself is comparatively simple. The anesthesia varies according to the choice of the individual surgeon. Some use ether exclusively; others, nitrous oxide; while a third group prefers local anesthesia.

The method which he has found most satisfactory is as follows: Morphine in sufficient dosage is administered subcutaneously to produce drowsiness. It is important to begin the administration of this about three hours before the time set for the operation. He repeats the dosage quantity to produce results in the individual case.

The patient is then placed in an upright position on the operating table, and the line of incision in a wrinkle at the base of the neck is infiltrated with 1 per cent novocaine. The skin is incised together with fat, platysma, and fascia. Flaps involving these structures are then turned up and down, and the sternohyoid and sternothyroid muscles and the deep fascia are exposed. The latter is incised in the median line, and this, with the extrinsic muscles of the larynx, is retracted on either side. In case of large tumors these muscles have been stretched so that it is rarely necessary to cut any of the muscle fibers.

The gland is exposed and lifted from its bed and removed, leaving the posterior capsules with a thin layer of gland and the parathyroid bodies. The isthmus should always be removed for reasons already mentioned.

A small cigarette drain should always be left in to drain the blood and free thyroid

material. The fascia is closed in the median line, and the skin flap with two rows of sutures, to prevent the spreading of the scar, which is hardly noticeable if made in a wrinkle at the base of the neck, instead of over the most prominent part of the tumor. He usually uses a No. 1 plain catgut subcutaneous suture, which does not have to be removed, and makes a very little scar.

In a series of 208 operations on the thyroid gland, 80 per cent of which were for hyperthyroidism, the mortality has been a little less than 2 per cent. Two of the fatal cases died within twelve hours of acute hyperthyroidism, while a third passed away with acute abdominal disturbance, suggestive of mesenteric thrombosis.

Stanton thinks local anesthesia, with morphine narcosis, the selection of the proper time for operation in the individual case, resorting to palliative operations or injections of boiling water in order to prepare the patient for a radical removal, and finally the removal of sufficient gland, are the three important steps in the progress of thyroid surgery during the past decade.

Treatment of Tetanus.

In the *American Journal of the Medical Sciences* for June, 1921, FREEDLANDER states that large doses of antitoxin have been rather commonly used in the treatment of tetanus. By reporting four consecutive cases which recovered following the use of large amounts of antitoxin intravenously, he hopes to emphasize the value of this form of treatment.

The routine procedures adopted follow very closely those used by Woolf in reporting a successful case.

1. Antitoxin was given in dosages of 10,000 to 20,000 units, intravenously, several times daily until all spasm was gone.

2. Morphine hypodermically and chloretone by rectum are given every four to six hours during the stage of reflex hyperexcitability.

3. Liquid nourishment and large amounts of water are given every two hours.

Does a Negative Schick Test Indicate Present and Future Security from Diphtheria?

In the *Archives of Pediatrics* for June, 1921, PARK states that the Schick test can be compared with vaccination. A positive Schick reaction or a successful vaccination is a definite sign of a lack of immunity. A negative Schick or a negative result from vaccination is a strong suggestion of immunity, but not an absolute assurance. In both cases this uncertainty is because of doubt as to the potency of the product and the accuracy of the technique. In either case a repetition of the inoculation may be followed at times by a different result. Because of these facts it would be foolhardy to refuse to give a child antitoxin who had a history of a negative Schick test in the face of suspected diphtheria, just as it would be foolhardy to rely on a recent unsuccessful attempt at vaccination in the face of definite exposure to smallpox. Either improperly measured toxin or imperfect technique will probably prevent the development of the positive Schick reactions in susceptible persons. The failures are so few, however, that it is justifiable to consider that persons are in all probability immune who have a record of a carefully done negative Schick test.

It is very difficult to state to what slight degree, if any, a child or adult is liable to diphtheria who has enough antitoxin to prevent the development of a Schick reaction after a correct injection of the proper amount of toxin. An outbreak described by Blauner gives the nearest approach to proof that Park has met with, for the statement that such persons may under unusual conditions develop a moderate infection. The fact that the cultures from the different cases showed different agglutinative types of virulent bacilli is proof that the cases did not come from a single source. The additional fact that more than 50 per cent of the children in other rooms were carriers of virulent diphtheria bacilli and yet developed no symptoms of diphtheria is strong evidence that the antitoxin in them was sufficient

under ordinary conditions to protect them. The final fact that in the last two cases the diphtheria bacilli were not even present shows that in this outbreak an infection other than diphtheria bacilli was capable of causing tonsillitis and was probably the primary cause. Considering all the facts together, it would seem to Park that in spite of sufficient antitoxin to give a negative Schick test these children were, after infection with pyogenic cocci, really infected with the diphtheria bacilli that were previously in their throats. He believes the antitoxin present in the cases would have prevented any appreciable development of diphtheria and that the cases would have recovered as certainly without the injection of additional antitoxin. It is not certain that the outbreak was not due to the pyogenic cocci alone.

Park and Zingher consider the Schick test most reliable, when the toxin is of proper strength and the method of employing it is correct, in showing the presence or absence of antitoxic immunity to diphtheria. A negative reaction after the age of two or three years indicates that the individual is protected, probably indefinitely, against the disease. The great majority of positive reactions in children are true reactions and indicate an absence of antitoxin, and therefore, unless other antibodies are present, a susceptibility to diphtheria. They consider the test of great value in determining clinically the efficiency of the immunization of susceptible individuals who have been injected with mixtures of diphtheria toxin and antitoxin. For this purpose only positive Schick cases should be chosen, and after the injections they should be tested one, three, six, and twelve months later to determine whether a sufficient amount of antitoxin had developed early or late to inhibit the Schick reaction, showing thereby the production of an active immunity to diphtheria. They use the Schick test to clear up the diagnosis of clinically doubtful cases of diphtheria. A negative reaction excludes diphtheria, while a positive Schick reaction leaves the diagnosis of diphtheria still a probability.

The Schick reaction has added further proof to the clinical and experimental observations that very toxic cases of diphtheria do better when given an early intravenous injection of antitoxin than when it is administered in any other way. It reveals the fact that an intravenous injection of antitoxin is able to partly neutralize toxin six hours after its absorption by the tissues, and thus gives us hope in some of the late cases of diphtheria. The results with the Schick test will serve as a reminder that after contact with the tissues for more than a few hours the effect of the toxin can no longer be prevented; that a day, and in fact hours, of delay in the administration of a therapeutic dose of antitoxin may mean not only the absorption but the final binding of a fatal dose of diphtheria toxin.

Test for Patient's Capacity for Operation.

In the *Ohio State Medical Journal* for June, 1921, McKESSEN states that we are occasionally asked to anesthetize patients who may be regarded generally as inoperable. Without the operation death may be inevitable, and with it, probable. If the patient is unable to withstand the burden of beginning narcosis, the operation ordinarily must be abandoned. But, he asks, how may we more surely determine that the patient will succumb during or immediately after the operation? How can we avoid the hopeless cases, without abandoning any which might be cured? The answer to these questions is difficult and depends upon many factors beside the resistance of the patient: Duration and character of operation; the surgeon, the anesthetist, the anesthetic, and the use of other agents calculated to prolong life. It is a delicate situation in which any one member in the team may cause disaster on the table, and in which the most intelligent coöperation of all may not avoid it.

The pulse may not be extreme in rate and the blood-pressure may be shamming. The real question is, how much reserve

have we to draw upon, or will a slight interference break the delicate balance of pulse, blood-pressure, and respiratory relations, and initiate an immediate demise?

In presenting the value of blood-pressure guides in operation and surgical prognosis, Miller emphasized the value of Moots' rule for determining the index of the patient's resistance. This rule may be thus stated:

The pressure ratio, a fraction having the pulse pressure as numerator and the diastolic pressure as denominator, may be normal between 40 and 60 per cent. If the ratio lies between 25 and 75 per cent the case is probably operable; if outside these limits it is probably inoperable.

In checking up the accuracy of this rule in a series of 1000 cases, Miller found that in the operable risks 3.23 per cent of the patients died and 96.7 per cent recovered; in the inoperable risks 23.07 per cent of the patients died and 76.93 per cent recovered.

For determining the presence of operative shock under anesthesia a rule formulated from McKesson's own experience is an important guide. It is thus stated:

With a pulse rate of 120 or more, a pulse pressure of 20 mm. or less, and a diastolic pressure of 80 mm. or less in a patient, who at the beginning of the operation had presented normal pressure, frank shock occurred. If these low pressures are continued without improvement for more than half an hour, a vicious circle is generally established, which without treatment will cause the death of the patient.

In checking up the accuracy of this rule in the 1000 cases studied, Miller found that in patients who were within the danger zone as determined by this rule for more than twenty-five minutes, the mortality rate was 69.23 per cent.

In order to standardize the surgeon's and anesthetist's conception of circulatory depression, the following three degrees established by Moots and McKesson have been accepted by the National Anesthesia Research Society and included in their uniform Anesthesia Record.

These degrees of circulatory depression are:

1. *Safe*: Ten to fifteen per cent increase in pulse rate without change in pressure. Ten to fifteen per cent decrease in blood-pressure without change in pulse rate.

2. *Dangerous*: Fifteen to twenty-five per cent increase in pulse rate with fifteen to twenty-five per cent decrease in blood-pressure.

3. *Fatal*: Progressively increasing pulse rate above 120 with progressively falling blood-pressure of 80 mm. or less systolic, and 20 mm. or less pulse pressure, for more than 20 minutes.

Serum Desensitization.

MACKENZIE, in the *Journal of the American Medical Association* of June 4, 1921, states that despite the many obscurities with which the problems of human sensitization and desensitization are beset, experience has demonstrated beyond question that, before serum is administered, information regarding the presence or absence of hypersensitiveness should be obtained. One should find out whether the patient has had asthma or allergic rhinitis from horses, or whether he has previously been treated with serum, and if so, by what route the serum was administered. An intracutaneous test should be made with horse serum in 1:10 dilution, injecting 0.1 Cc. or less—preferably 0.02 Cc. A control test with physiologic sodium chloride solution, or better, with a 1:10 dilution of rabbit or sheep serum, should be made at the same time. One should wait half an hour before deciding whether the reaction is positive or negative. The interpretation of the mild type of positive reaction is not always easy; but if there is a definite enlargement of the small elevation caused by injecting the serum into the skin, and if this injection wheal is surrounded by a zone of erythema, the test is positive, provided the control test has not behaved in a similar way. The size of the wheal and its surrounding zone of erythema give a rough index of the degree of hypersensitiveness. A large wheal and a wide zone of erythema, and especially a wheal which has projections like pseudopods

extending away from it, indicate greater hypersensitiveness than a small wheal without pseudopods and a narrow zone of erythema. There are, however, a few patients in whom the skin test fails to reveal a state of hypersensitiveness; at least he has observed one patient with a very definite history of allergic rhinitis from horses whose skin test with the dandruff protein was negative, but in whom symptoms of rhinitis could be readily produced by instilling a drop of an extract of horse dandruff protein into the nostrils.

If the patient has had asthma and gives a positive skin test, great caution is necessary. The first desensitizing dose should be given subcutaneously, beginning with a dose not larger than 0.025 Cc. The dose should be doubled every half-hour until 1 Cc. is given. Then 0.1 Cc. is given intravenously. After twenty minutes the dose is doubled. In case the therapeutic serum is to be given intravenously, the intravenous injections are continued, the dose being doubled every twenty minutes until 25 Cc. has been given without reaction. Four hours later 50 Cc. may be given, and after eight hours the treatment may be continued in the usual manner. In case a reaction occurs one should wait the usual interval, and then the last dose that gave no reaction or only a mild one is repeated. There is no evidence suggesting a cumulative action. The first portion of the serum should always be given very slowly and careful watch kept for respiratory embarrassment, cyanosis, skin eruptions, edema, and symptoms of collapse.

In case the therapeutic serum is to be administered intraspinally the subcutaneous doses should be carried out in the same way and four or five of the intravenous doses given, when, if there has been no reaction, the intraspinal route should be tried very cautiously. It should be realized, however, that in the exquisitely hypersensitive patients with bronchial asthma serum therapy may be impossible.

As for the patient who has previously been treated with serum, and is demonstrably hypersensitive by the skin reaction,

the same procedure should be followed, even though such patients probably never attain the same degree of hypersensitivity as the asthmatic individuals with natural sensitization. It is probably quite safe with some of these less sensitive patients to shorten the desensitization programme in case the first few injections produce no reaction. This may be done by increasing the doses a little more rapidly than by doubling the preceding amount. The first intravenous dose should, however, never be more than one-tenth of the largest dose tolerated subcutaneously. It will be found that only very rarely is it impossible to desensitize the patient whose sensitization dates from a previous treatment. Finally, when attempting desensitization, one should never inject serum without having adrenalin at hand.

Serum Treatment of Lobar Pneumonia.

In the *New York Medical Journal* of June 15, 1921, NILES, in concluding his presentation on the serum therapy of pneumonia, lays emphasis on the following points:

1. An exact etiological diagnosis should be quickly made in every patient suffering with lobar pneumonia.
2. With very few exceptions Type I pneumococcus infections should be treated with Type I antipneumococcus serum.
3. The serum should be given in large doses (generally 100 Cc.) and repeated every eight hours until the temperature falls and remains below 102°; if it subsequently rises the administration of serum should be repeated unless complications, which should always be suspected, are determined.
4. The serum treatment should be commenced as early as possible; it should reach the vein at about the body temperature, and the first 15 Cc. should be given slowly.
5. Polyvalent serum should never be given, and Type I serum should be administered only to prove Type I infections.
6. The serum treatment above outlined reduces the mortality of Type I infection more than fifty per cent.

The Clinical Use of Radium.

DELAND in the *Boston Medical and Surgical Journal* of June 30, 1921, states that the large majority of superficial epitheliomata are successfully treated with radium. A lesion on the forehead, neck or face may be excised, if desirable, but lesions on the eyelids, inner canthus or nose are better treated with radium, for there is less deformity. Large lesions are often excised, cauterized, and radiated afterward, if necessary. Excision of these lesions for the purpose of having a pathological examination is not important. They are the type that metastasize very late in the disease, if at all, so that the removal of glands does not have to be contemplated. Epitheliomata of the ear does not respond as readily as others, partly because a smaller dose must be given. The cartilage is easily destroyed if a heavy treatment is given. This type occasionally does metastasize to the neck.

Keratoses of the face are easily destroyed by radium. Keratoses and precancerous lesions of the lips are also easily destroyed. However, it is his policy to treat with radium nothing but the earliest keratoses of the lip, except for palliation, in cases clearly inoperable. All cancers of the lip, or suspicious keratoses, should be removed by a V-shaped excision, the specimen examined, and a neck dissection done if indicated. These lesions metastasize to the neck very early, and the only safe way is to do the complete operation.

Cancers of the tongue (if inoperable), floor of the mouth, and tonsils are treated by the insertion of emanation tubes. Relief of symptoms usually follows, and occasionally an apparent cure. However, the neck metastases, if they appear, are not easily affected by radiation. X-rays seem to have more effect than radium.

Many cases of leukoplakia are relieved by radium. These are probably treated equally well by fulguration.

In cancer of the antrum, combined operation and radium treatment is the method of choice. The radium should be applied at the time of operation, after all the gross cancer has been removed.

Cancer of the esophagus does not do well under any form of treatment. Some cases are relieved by one or two radium treatments, but this is only temporary. In order to destroy the cancer, a treatment heavy enough to cause a severe reaction is necessary. This reaction is often serious enough to cause complete obstruction. Frequently the growth extends into the glands of the mediastinum and cannot be reached.

Radium has no value, either curative or palliative, in the treatment of cancers of the stomach or intestines.

Rectal cancer should never be treated with radium if it is operable. If inoperable, a colostomy should precede treatment. Otherwise the pain and tenesmus resulting from the necessarily heavy radiation are very severe—far worse than the discomfort of a colostomy.

Cancer of the breast, if inoperable, is best treated by x -ray. In some clinics radium is used, but a very large amount is needed to get the same results given by x -ray. Local implantations may be used to destroy some of the nodules, but this does not take care of the glands.

Cancer of the thyroid may be treated by the insertion of emanation tubes, but x -ray is probably better.

Many cases of cancer of the larynx are relieved by radium therapy, but few permanently. Combined operation and radium works well in certain cases. Necrosis of the laryngeal cartilage must be guarded against. Tracheotomy must precede treatment, otherwise the reaction may complete the obstruction.

Prostatic cancer may be treated by the insertion method through the peritoneum or by the intraurethral route. Probably the best results are by the combined operative and radium method. Results, as a rule, are not very good.

Opening of the bladder and the insertion of emanation tubes is the best way to treat vesical cancers, although they may be treated by the use of cystoscope and by applicators inserted in that way. Female bladders are more easily treated than those of the male.

Cancer of the uterine fundus is best treated by hysterectomy. If hysterectomy is contraindicated, good results are secured by intrauterine radium treatments.

In cancer of the cervix which involves the broad ligaments or encroaches on the vaginal wall and is therefore inoperable, the treatment of choice is the insertion of numerous tubes into the cervical growth, combined with steel-screened intrauterine radium treatments. Preliminary cauterization is not advisable, for the cauterization accomplishes no more than the radium, and if done at a separate sitting, it involves a loss of time. Treatment by the former method promises good results. Nearly every patient is relieved of pain, bleeding, and discharge, and some are clinically cured by radium. Cancer of the vulva and vagina is treated by insertions.

Large fibroids of the uterus should be removed by operation, if operation is not contraindicated. Many smaller fibroids are relieved by intrauterine radium therapy. Relief is also given to certain obscure cases of menorrhagia.

Keloids respond readily to radiation. It has been found that they disappear more quickly if a moderately heavy treatment is given rather than a heavily screened treatment.

Cavernous nevi are easily destroyed, but port-wine marks are more resistant, requiring numerous treatments. Hairy and pigmented nevi respond fairly well. Radium is to be preferred for these lesions in children, for the treatment is painless. Warts, occasionally lupus, psoriasis, and lichen planus, which are resistant to other treatment, may be destroyed by radium.

Radium is now the accepted treatment of myelogenous leukemia. The white count and the large spleen are reduced by one or two treatments. The effect is only temporary, for later the spleen enlarges and the white count rises. A second series of treatments has less effect than the first, and so on, until finally the patient dies. Lymphatic leukemia may be helped for a time, but the relief is more temporary than in the other type.

Hodgkin's disease, malignant lymphoma, and lymphosarcoma, as a rule, are easily influenced by radiation. The story is much the same as in leukemia. At first they respond quickly, but when they recur they are more resistant. When radium loses its effect, the end comes very quickly. Certain of the Hodgkin's cases belong to the so-called chronic type and live several years with an occasional treatment. Usually they die from enlargement of the abdominal retroperitoneal or mediastinal glands.

Metastatic glands of squamous-cell cancer are not affected much by radium. A few cases have been treated by the insertion method, and the glands have become smaller. The glands do not disappear unless they are entirely destroyed, and this endangers neighboring vessels and nerves.

Sarcoma of the small-cell type responds to radium therapy better than the spindle-cell type. Combined operative and radium treatment is frequently the best. If radium is used alone, the insertion type of treatment gives the best results. Many tubes should be inserted into the periphery of the growth.

Vaccine Therapy in Gonorrhea.

In the *Journal of the Royal Army Medical Corps* for June, 1921, BOYD states that only 44 cases were complete in the vaccine series, and 36 in the control series, and the total number of cases involved in the statistics is therefore 80.

Average stay in the hospital.	Control. 56 days	Vaccine. 63.4 days
Prostatitis.....	11.1 per cent.	9.1 per cent.
Epididymitis.....	—	4.54 per cent.

Average Stay in Hospital.—The vaccine series required seven more days in the hospital than the control. However, a larger number of control cases was outstanding, and not included in the statistics, and these would help to level out the results in the two series, as the reason for their being outstanding is that they have been an unduly long time in the hospital.

Prostatitis.—There is no appreciable variation.

Epididymitis.—Two cases occurred in the vaccine series, none in the control series.

In both the control series of cases the average stay in hospital is shorter. This, however, is probably due to causes other than the administration of the vaccine. There is little variation in the other factors. The slight reduction of epididymitis in the vaccine series in the first experiment did not hold in Experiment 2.

The Influence of the Electric Current on the Absorption of Drugs.

In the *Proceedings of the Royal Society of Medicine* for June, 1921, INCHLEY states the results of experiments made to determine the amount of absorption of drugs through the skin by means of the electric current. Rabbits, cats, or guinea-pigs were used, anesthetized with urethane. The electrodes employed are described. The amperage, time, the area of skin treated, and the concentration of drug are given in each case. Absorption through the skin was proved in the case of atropine, aconitine, and the cyanide ion; tracings showing the known pharmacological effects of the drug being recorded on the kymograph in each case. With strychnine return of reflexes was obtained. Absorption of iron from ferrous sulphate solution was shown by increased percentage of iron in the skin and underlying muscle determined by chemical estimation. Calcium absorption, from calcium chloride, was proved by its effect in reducing the clotting time of the blood to half the normal.

Experiments on the knee-joint are described showing absorption through the skin of the salicylate ion and of the ferrocyanide ion; penetration was estimated by staining the excised and opened joints with ferric chloride or ferrous sulphate solution respectively. The current caused no deeper penetration than could be obtained by simple subcutaneous injection of the same concentration of drug under the skin covering the joint. Thus, with potassium ferrocyanide solution there was more intense staining of the deeper tissues (cartilages of femur, tibia) when injected subcutaneously than when introduced by the current. With

sodium salicylate no penetration into the joint occurred either when injected subcutaneously or when introduced electrically. The superficial tissues (outer surface of capsular ligament, patellar tendon, and fascia) in one experiment were equally well stained by both methods of introduction, while in another there was intense but superficial staining in the electrically treated joint, but very slight staining in the injected one.

Cinchophen, Neocinchophen and Novaspirin in Rheumatic Fever.

In the *Journal of the American Medical Association* of June 18, 1921, HANZLIK, SCOTT, WEIDENTHAL, and FETTERMAN, in concluding their article on this subject, state:

1. Cinchophen gave partial relief from symptoms in rheumatic fever with doses of from 3 to 6 gm., and complete relief with doses of from 10 to 13 gm. (seven patients), while neocinchophen required a somewhat higher range of dosage, namely, from 3 to 8 gm. for partial and from 11 to 16 gm. for complete relief (three patients).

2. Novaspirin was therapeutically worthless in the treatment of rheumatic fever (three patients), not giving even partial relief from subjective symptoms. This is due to inadequate concentration of salicyl in the tissues, as indicated by the low (from 14.8 to 23.4 per cent) excretion of salicyl in urine after large doses of the drug.

3. Large doses of cinchophen and neocinchophen, such as are necessary in the treatment of rheumatic fever, produce characteristic symptoms of salicylism ("toxicity"), which, however, are less pronounced than those caused by corresponding doses of salicylate. Cinchophen differs from salicylate by causing epigastric pain, owing, presumably, to local irritation by the drug. Pain in the epigastrium was absent after large doses of neocinchophen, presumably because of its relatively low solubility in water and weak alkalies, possibly also because it is an ester.

4. Large doses of cinchophen were found

to slow the pulse rate of both febrile and afebrile individuals, and the same occurred after neocinchophen in febrile patients. Therefore the cardiac slowing produced by cinchophen is due to a direct depressant action on the circulation.

5. Cinchophen is injurious to the kidney, as indicated by the occurrence of albuminuria, and sometimes casts and white blood-corpuscles, in the majority of seven individuals that were observed, and a diminution in the excretion of phenolsulphonephthalein in the five individuals that were studied. Neocinchophen is variable, albuminuria and a diminution in the excretion of phenolsulphonephthalein occurring in about one-half of the nine individuals that were observed.

6. As compared with salicylate, cinchophen appears to be about equally efficient, while neocinchophen is somewhat less efficient, as judged by the dosage necessary for therapeutic relief in rheumatic fever. The symptoms of "toxicity" are about the same and renal injury somewhat less after cinchophen, and both the "toxicity" and the renal injury are less pronounced after neocinchophen than after salicylate in corresponding doses.

The Effect of Pituitary Extract on the Rate of Urine Formation in Man.

In *Southern Medicine and Surgery* for June, 1921, MCBRAYER states that the preparation used in his study is the obstetrical pituitrin made by Parke, Davis & Company, who, in a recent personal communication, state that this product is a quantitatively standardized aqueous extract of the infundibular portion of the pituitary gland, and that obstetrical pituitrin is just one-half as concentrated as surgical pituitrin. This product was used because he believes with Rowntree that for such studies it is probably the best preparation available.

The manufacturers' statements concerning the pharmacologic action of this preparation agree with the statement in that admitted authority, Cushny's text-book, "Pharmacology and Therapeutics, or the

Action of Drugs," which says that "when injected intravenously the blood-pressure rises;" that this "rise in pressure is due to the constriction of the peripheral arterioles, as is shown by the lessened volume of the organs." He concludes that "the pituitary substance must act directly on the muscle fiber" because this action is not interfered with by severing the vasoconstrictor nerves or by paralyzing the myoneural junctions with ergotoxin. However, this constrictor action on the arterioles seems not to be without exception, for the same writer finds that "one of the earlier observations was that pituitary injection was followed by a profuse secretion of urine, generally accompanied by dilatation of the renal vessels and an increase in the volume of the kidney," though there is some conflicting evidence to prove that this is the complete *modus operandi* in the diuresis. Cushny's statements are arrived at by reasoning from analogy, in that they are mainly based on animal experimentation. Norris states practically the same thing in the third edition of his "Blood Pressure and Its Clinical Application:" "It (pituitary extract) also has a diuretic effect due to direct stimulation of the renal cells, usually aided probably by a concomitant vasodilatation, because there is no constant relation between pituitrin diuresis and either systolic or pulse pressure or the ratio between them."

Realizing that his series of studies is numerically small, however, knowing that the facts were obtained in a very detailed and accurate manner, and furthermore appreciating the utmost consistency in the results, McBrayer feels that the following conclusions are warranted:

1. During the first hour following the hypodermic injection of medicinal doses of pituitary extract the urine output is markedly decreased.

2. During the same period of time the total output of urinary solids is markedly decreased, both relatively and actually.

3. During the same period of time there is a marked and constant decrease in the systolic, diastolic, and pulse pressures; and

pulse rate, which decreases, appears to be definitely related to the decrease in the fluid and solid output of the urine.

Liver Regeneration Following Chloroform Injury as Influenced by the Feeding of Casein or Gelatin.

In the *Archives of Internal Medicine* for June, 1921, DAVIS and WHIPPLE state that gelatin, although an "incomplete protein," seems to be equally as efficacious as casein in the regeneration of liver parenchyma destroyed by chloroform.

After a 50- to 60-per-cent necrosis, a feeding period of nine days with either substance will restore the liver to within 10 or 15 per cent of normal. This liver cell regeneration is comparable to that obtained with a meat diet, approaches that given by a high carbohydrate diet, is definitely less than with a full mixed diet, but greater than with a fat diet or with fasting.

The liver repair on gelatin feeding emphasizes again the important fact that the body is able to conserve certain amino acids or split products from its endogenous wastage products and recast these groups into the complex liver cell.

The Use of Pituitrin by Mouth in Certain Cases of Uterine Hemorrhage.

In the *Proceedings of the Royal Society of Medicine* for June, 1921, DONALDSON states that it is never an easy task to demonstrate the therapeutic value of a drug, and the difficulty is increased when the drug is used for a minor ailment which does not necessitate the patient being under continuous observation. Such then is the difficulty he has had to contend with in trying to prove that pituitrin by mouth is a most valuable drug in treating certain cases of uterine hemorrhage.

He has been using pituitrin for about eighteen months, both in private and in the hospitals to which he is attached.

Every patient complaining of uterine hemorrhage is carefully examined to ex-

clude the possibility of carcinoma, large fibroids, or other condition requiring urgent operation. This then leaves for treatment cases of endometritis, small fibroids, retained products of conception, cases of menorrhagia and epimenorrhea, including those cases in which the exact cause cannot be diagnosed but is probably ovarian in origin.

The drug is always prescribed in tablet form 2 grains three times a day after food. It has been suggested that it should be given in a fluid form, in order to promote absorption by the stomach.

In two of the hospitals he has treated

about fifty cases in the last six months. Of these, thirty-seven responded to treatment, some within a few days. Of the remainder, four did not return to report; five were subsequently admitted and found to have polypi, etc., and in four the notes state definitely that no improvement took place.

In private he has had cases which responded to pituitrin after being treated for weeks with ergot and other drugs.

Personally, he is convinced of the value of pituitrin by mouth, and this opinion is shared by all the clinical assistants and house surgeons he has had working with him.

Surgical and Genito-Urinary Therapeutics

The Early Diagnosis of Acute Abdominal Infections.

ECCLES (*British Medical Journal*, May 7, 1921) writing on this topic holds that acute appendicitis is the most frequent cause, constituting over 70 per cent of all cases; intestinal obstructions 18 per cent; perforations 7.2 per cent; cholecystitis 2.4 per cent; torsion of the pedicle 1 per cent; acute pancreatitis one-half of 1 per cent.

In the adult female three other conditions have to be thought of, namely, rupture of ectopic gestation, acute salpingitis, and acute inflammation of the uterus, such as follows septic infection in criminal abortion, and lastly acute basal pleurisy or pneumonia, or even the pain prior to the vesicular eruption in "shingles," may simulate the acute abdomen.

There are certain features which are common to every case of "acute abdomen." Two of these stand out preëminently, namely, "acuteness" and, if one may be allowed to coin the word, "abdominalism." Acuteness is evidenced by sudden onset and rapid development of signs and symptoms.

Abdominalism is evidenced by the fact

that the abdomen is obviously the site of the lesion.

The characteristic signs and symptoms of an "acute abdomen" are: Sudden onset, abdominal symptoms, anxious expression, rising pulse rate, often an attack of vomiting, sometimes repeated, temperature out of relation to pulse rate, abdominal pain, often tenderness and rigidity of the muscles of the ventral abdominal wall. When a patient presents all these signs and symptoms together, the case is one which may be classed as a surgical emergency.

A sudden onset, severe pain often near the umbilicus, one attack of vomiting, a rising pulse rate, out of proportion to the rise in temperature, and rigidity of the lower half of the right rectus, are sufficient to diagnose appendicitis in its early stage and to call for operation at once.

Perhaps nothing gives rise to an "acuter abdomen" than the perforation of a hollow viscus. The stomach, the duodenum, the appendix, and the gall-bladder may all give way, and their contents pass into the peritoneal cavity, producing the most alarming signs and symptoms.

To take a typical case of the perforation of a duodenal ulcer in a male. He is at

work when a sudden agonizing pain seizes him in the upper half of the abdomen. He is doubled up, and gasps for breath, because his diaphragm will not descend. He assumes the horizontal position and vomits. When now examined he appears most anxious, his pulse is small and rapid, there is still much pain in his abdomen, the whole of the ventral abdominal wall is rigid, and particularly the upper half of the right rectus. Even upon the foregoing signs and symptoms the practitioner is quite warranted in diagnosing a perforation, and preparations should be made for an immediate operation.

Various structures within the abdomen may possess pedicles. If the pedicle of any tumor or organ becomes twisted there is immediately interference with the circulation of blood in the attached structure.

The following are some of the intra-abdominal torsions which may occur: Ovarian cyst; subperitoneal uterine fibroids; "floating" kidney; wandering spleen. Of these, the twisting of the pedicle of an ovarian cyst is far the most common. If this happens suddenly, a condition which may aptly be called an "acute abdomen" follows.

It is the so-called hemorrhage variety of inflammation of the pancreas which gives rise to symptoms of an "acute abdomen." The lesion is due to a rapid infection of the pancreatic tissue via the duct, or possibly through the blood, by a streptococcus. The onset of the symptoms is sudden, so sudden that the patient is hors de combat in a few minutes. This is probably due to the loss of blood into the pancreatic tissue producing a profound shock similar to a blow on the "pit of the stomach." There is abdominal pain, referred to the epigastrium at first, and soon to the back in the lumbar region. Vomiting occurs, but is not persistent. The pulse rate quickens and the volume of the pulse is less. The temperature may fall while the pulse goes up, but later there is a rise of temperature. A very characteristic sign occurs even in the early stages, and it is one which serves to distinguish this cause of an "acute abdomen"

from all the others. The patient's face and extremities are distinctly cyanosed, and there may be some dyspnea.

There are certain other conditions which, while they may give the patient very severe distress, nevertheless do not place his life in danger. He refers to what may be termed "the colics"—intestinal, renal, or biliary.

We have all seen patients suffering agonies from each of these spasmodic contractions of unstriated muscle, but very few of us have ever seen death occur primarily on account of any one of them. Intestinal colic is very common, and unless very severe it does not produce a condition which really simulates an acute abdomen. There is one sign which is of great importance, and that is that pressure upon the abdominal wall tends to relieve the patient's pain. Of none of the lesions producing an "acute abdomen" can the same be said. It is so characteristic that pressure causes pain in the serious condition, and does not do so, but actually relieves it, in simple colic; that if there is tenderness on pressure associated with any other symptoms of an "acute abdomen" it is better to diagnose the presence of a lesion which is a menace to life.

Poisonings occur and simulate an "acute abdomen." There is generally, however, a definite history of the intake or absorption of an irritant substance which helps the diagnosis.

Role of the Prostate and Seminal Vesicles in Arthritis.

LOWSLEY (*New York Medical Journal*, May 4, 1921) observes, in the treatment of arthritis, that better results were obtained by operation than by any other means. The use of internal medication was least helpful. Local applications to the joints were serviceable in about three-fifths of the cases. Gonococcal vaccine, used in 16 cases, was at least temporarily beneficial in 10. Palliative treatment of the prostate and seminal vesicles in 9 cases gave 2 cured, 5 improved, and 2 unimproved. Plaster casings and splints were used in 23 cases. Improvement followed in less than 50 per cent of the

cases, but the series of six cases treated by heavy casts to the joints and baking afterwards were singularly successful, all showing marked improvement. Operations on the seminal vesicles showed improvement in nine cases out of ten.

The Prevention and Treatment of Puerperal Infection.

BELL (*British Medical Journal*, May 14, 1921) notes that one of the most disturbing features of the mortality rate in regard to puerperal sepsis is the fact that the maternal mortality from infective conditions, which to-day should be almost negligible, is not decreasing as we have a right to expect. Indeed, in the Registrar-General's last annual report the mortality is shown to be greater than in any previous year for fourteen years. It is probable, moreover, that if we could exclude the epidemics that used to occur in maternity hospitals and in the practice of certain midwives, and which we now know were the result of easily preventable contagion, the present mortality rate would be found to be not greatly different from that obtaining in preantiseptic days. In other words, while epidemics have been banished, the isolated case still runs an undue risk from causes that are preventable. Another important matter brought to light by recent statistics is that cases attended by doctors more often suffer with puerperal sepsis than those attended by nurses alone.

We all know the athletic young woman with her resistant pelvic floor, and the woman "living on her nerves" who will not willingly or cannot tolerate a normal, let alone a tedious, inert labor. We are well acquainted with the stunted growth and small pelves of many women in factory districts. But allowing for all these embarrassments, which are the penalties of modern life, there is still a large number of cases in which interference is practiced without scientific indication.

Twenty-five years ago "meddlesome midwifery," as it is called, was much less com-

mon than it is to-day, in spite of the fact that most of the procedures now practiced by the general practitioner, such as internal version and forceps delivery, were then in vogue.

Many make a practice of terminating with forceps nearly every labor at which they are present—more often than not with forceps taken from a "midwifery bag" which is far from clean and very imperfectly sterilized.

If the maternal mortality and morbidity rate is to be diminished, to say nothing of the number of operations for prolapse and other lesions due to hurried parturition, this practice must stop. It must be held to be a discreditable thing to terminate labor with forceps to placate the patient or to save the time of the practitioner, however skilful he may be.

There must be an honest recognition by all who attend childbirth that puerperal infection is almost always avoidable, and that the appearance of it in any case that has been examined, or in which interference has been practiced, is a serious reflection on the accoucheur or accoucheuse. If the whole profession would combine in an attempt to reduce the present incriminating figures a great change would be noticeable, not only in the statistics presented by the Registrar-General, but also in the health of the female population which is perpetuating our race.

The remedy does not lie in better teaching, so far as practitioners are concerned, but in obedience to the dictates of conscience. No man can plead ignorance of asepsis and antisepsis to-day. The trouble is that imperfect asepsis is practiced as a sop to conscience instead of complete asepsis as a real scientific safeguard.

Examination per rectum with the gloved finger should be practiced in the case of the parturient woman in preference to vaginal examination. Forceps delivery is far too common. Most women deliver themselves safely if left alone. Forceps delivery, when necessary, is a surgical operation, and should not be conducted in insanitary surroundings.

All lacerations, not only those of the perineum, must be efficiently sutured.

Care must be taken to maintain the natural defences of the patient.

With regard to the treatment of puerperal infections the chief conclusions are:

The evacuation of large pieces of placenta and efficient antiseptic irrigation of the uterus should be practiced in the early stages of infection of the placental site. All infected lacerations should be purified.

The employment of autogenous vaccines and polyvalent serum is often useful in cases of generalized infection.

Major operations must be performed, especially ligation of the veins in puerperal thrombophlebitis, without hesitation and in good time when indicated.

As to the more general considerations, the principal conclusions are:

Much research is required to define more accurately and fully the general and local defences against infection in the normal parturient woman, and the causes that lead to their diminution.

The immediate reception and accommodation of all cases of puerperal infection into a special ward connected with gynecological and obstetrical clinics, where each can be adequately investigated and efficiently treated, should be possible.

Aseptic midwifery is prohibitory, costly to the general practitioner in comparison with the fees obtaining in the poorer parts. In every district a depot should be established by the local authority from which the general practitioner could obtain a sterile outfit free of cost.

The present statistics are an urgent indication that better organization is required. In various centers, especially in industrial districts, large maternity and gynecological clinics should be instituted. When possible they should be attached to the teaching schools. These clinics should form base hospitals for wide areas, in the outlying parts of which a few beds should be set aside in existing cottage hospitals, or, failing these, small field hospitals should be established for the reception of maternity cases. In these field hospitals general

practitioners would have an opportunity of working under the best conditions when interference was necessary. In cases of special difficulty skilled assistance could be summoned from the base hospital, if the patient were too ill to be moved. Whenever difficulty was anticipated the patient could be sent before the commencement of labor to the base hospital for delivery.

The Present Status of the Local Anesthesia Problem.

BRATRUD (*Minnesota Medicine*, April, 1921) observes that there are at present no statistics available as to the rate of deaths under local anesthesia. Occasionally a case is reported, as death from local anesthesia, from apparently non-toxic substances, such as novocaine. Every person knows or should know the toxicity of cocaine, and that it is about as dangerous an anesthetic as could be used in major surgery. A number of deaths have been reported from comparatively minor operations. The death-rate from general anesthesia, under ether, has been stated to be 1 in 10,000, under chloroform 1 in 3000, and under gas-oxygen about the same as chloroform, when given by a skilled anesthetist. Statistics recently collected by Salzer and Stewart give the mortality rate from general anesthesia at 1 in 600, but the author doubts not that it is even greater than this, except in well-organized clinics, where trained anesthetists are available.

Morris has shown by tests that acetone bodies are present in the urine after ether anesthesia. With lowered carbon dioxide combining power of blood, there is an increased retention of nitrogen. It is a well-known fact that, where the carbon dioxide combining power of blood in diabetics is lowered, there is an increased formation or retention of blood sugar. In a series of cases Short shows the carbon dioxide combining power of the blood to be decreased 4 to 17 per cent under ether, the anesthetic varying in duration from twenty-six to seventy minutes. The drop is greater from

chloroform. Killian has shown that the drop is much less under spinal or gas-oxygen anesthesia. The fact that the mortality rate in surgical diabetics has been reduced from 6 per cent under general to 3 plus per cent under local anesthesia, speaks for itself.

Preventable deaths from anesthesia may be divided into three groups: (1) those resulting from the anesthetic itself; (2) faulty administration; (3) pathologic and physiologic causes in the patient. Some drugs used for local anesthetics are practically non-toxic, for example, novocaine and saligenin. As regards the administration of local anesthesia, it is done, on the whole, with precision and knowledge on the part of the anesthetist. General anesthesia may be the choice in well-organized clinics, where trained anesthetists are available, where the functional state—i.e., cardiac reserve, renal function, metabolism, and so forth—has been well determined. It is not the well-organized clinics that have a high death-rate from anesthesia, but it is in the smaller cities, rural districts, or the hospitals, where the system is at fault and no trained anesthetist is available.

There are a few requirements necessary to the successful induction of local anesthesia:

Careful attention to essential details. These can be learned from any text-book, and unless known will mean failure.

Less manipulation of the tissues is entailed, and this means better technique. Exploration is made more by visual examination than by digital. If digital examination is necessary, combined anesthesia may be used, provided it cannot successfully be made under local. This does not require the stage of surgical anesthesia, but the stage of analgesia is sufficient. The surgeon should know the limitations and not subject any patient to pain, for shock can be produced from pain in this manner, just as easily as from any added trauma.

Coöperation of the patient and surgeon, combined with preoperative coöperation of nurses and attendants. Suggestive remarks at time of admittance may destroy the con-

fidence of the patient. This applies equally well to any procedure that transpires in the surgical amphitheater. Suggestive remarks by attendants or friends, such as "Are you having pain?" create an impression which may lead to loss of mental control.

In regional blocking knowledge of anatomy is essential.

In abdominal work, vertical retraction, combined with a position of patient calculated to secure negative abdominal pressure so essential to a successful visual examination, should be used. Digital examination can be made, provided no tension or traction is made upon the mesentery. The visceral peritoneum is not sensitive to pain, as far as we know, except in acute or sub-acute inflammatory conditions, but any manipulation of the parietal peritoneum will cause pain. The parietal peritoneum is very sensitive. Packing can be used if properly performed, but in a majority of cases it is only called for to prevent soiling of the field.

Dealing with the same subject Maxeiner favors novocaine as an efficient, non-toxic drug, one that can be used almost *ad libitum* as a local anesthetic of choice. To produce satisfactory anesthesia in major surgery it is imperative that large quantities of the solution be used. The control of absorption influences both toxicity and the duration of anesthesia. This will be accomplished by the use of adrenalin and, when possible, of a tourniquet. Adrenalin should not be used in the presence of a terminal circulation, as in the case of the finger or the penis, because of the danger of gangrene.

The simplest method of producing local anesthesia is the infiltration or the edematization of the tissues in and about the site of the operation. However, in many cases, regional methods are to be preferred. By the regional methods the nerves are blocked proximally to the site of the operation, and this is necessarily a more difficult procedure, demanding a thorough knowledge of the nerve supply to the operative field.

Regional anesthesia includes the following methods: (1) intraneural injections;

(2) paraneural injections; (3) spinal analgesia; (4) intravenous injections; (5) intra-arterial injections; (6) circumferential infiltration of Hackenbruch; (7) caudal anesthesia.

The paraneural or infiltration block, and the circumferential infiltration of Hackenbruch, are the simplest and the most commonly used. The others are more dangerous and require a certain technique which renders them more difficult.

The primary requisite is a number of good syringes, preferably of glass or metal, that will not leak even under high pressure, together with an assortment of needles, varying from 1 to 4 inches long and in caliber from 18 to 24, which will not become detached during use. The self-filling syringes and the Farr pneumatic injector possess great advantages over the ordinary syringes and render the injection more simple and more rapid.

For infiltration, infiltration block (paraneural), and caudal anesthesia, 5-10 to 7-10 per cent novocaine in Ringer's solution (with 3 to 5 minims of adrenalin 1:1000 to the ounce) has proved most satisfactory, while for intraneural injections 1 to 2 per cent novocaine in Ringer's solution is used with the same proportions of adrenalin.

Hypodermics of morphine and scopolamine may be given preliminary to the operation if neuro-local anesthesia is desired.

After first warning the patient, a very fine needle is introduced and a wheal made in the skin. A second needle of slightly larger caliber, 2.5 to 3 inches long, is introduced through this wheal into the subcutaneous tissues, injecting continuously as the needle advances. It is then run along subcutaneously for 2.5 inches, where a second wheal is made in the skin, but this time from beneath. Through the second dermal wheal the needle may be introduced painlessly at once. By then introducing the needle vertically through the anesthetized skin, the deeper layers may be infiltrated in the same manner until all the tissues through which the incision is to be made have been edematized. For the ordinary midline incision the injection has been made

and the abdomen opened painlessly in six minutes.

A most important point in the technique little emphasized is to always inject with the needle advancing or during its withdrawal, but never with the point stationary, because of the danger of an intravenous dose.

One of the best examples of this method is the brachial anesthesia of Kulenkampff. A wheal is made in the skin over the midpoint of the clavicle. With the finger over the subclavian artery, a long fine needle is introduced through the wheal downward, inward and backward, pointing in the direction of the second dorsal spine. Sensation referred to the little and ring fingers indicates the point for injection. Ten Cc. of a 1- or 2-per-cent novocaine solution is usually sufficient for complete anesthesia of the whole arm. The needle should be introduced unattached to the syringe, or if attached aspiration should be attempted to avoid an intravenous dose. The main objections to this method are that it is not absolutely free from danger and is technically difficult.

Paraneural injection or infiltration block about the nerve trunks edematizes the tissues. It is a much more simple procedure and very effective, especially when reinforced by subdermal infiltration at the site of incision. By the combined methods the cervical nerves may be anesthetized at their exit by infiltration block, reinforced by subdermal infiltration at the site of operation, permitting bloc dissection of the neck, thyroidectomies, laryngectomies, and so forth, to be done without pain. An infiltration block of the cervicals, together with the upper six thoracic nerves reinforced by subdermal infiltration, will permit radical amputation of the breast with dissection of the axilla to be done very satisfactorily. The combined method is also ideal in inguinal hernia, where edematized tissue may interfere with their identification. Here an infiltration is made under the skin along the line of the incision and the ilioinguinal and iliohypogastric nerves are blocked under the external oblique fascia near the anterior

superior spine. The genital branch of the genitocrural nerve is blocked after exposure of the cord.

In case of the extremities a subdermal infiltration may be made completely around the limb. Through this anesthetized ring the needle is introduced at right angles forming a transverse plane of infiltration completely through the extremity, depositing most of the solution in the neighborhood of large nerve trunks. The anesthesia is equally applicable to arm or leg and is complete and safe. It is surely a much safer procedure for the doctor, who alone must amputate or reduce a fracture, and give the anesthetic at the same time, in such an unfavorable location as a farm-house or in his office.

In abdominal surgery under local anesthesia, one must constantly bear in mind certain painful points that must be anesthetized, such as the round and broad ligaments, the ovarian pedicle, the meso-appendix, the mesentery, and the tissues of and about the bile ducts. These should be infiltrated before any attempt is made to handle them. Since the utmost care must be exercised at all times, to reduce trauma to a minimum, this teaches the surgeon a wholesome respect for tissues; the final results of which are less postoperative vomiting, fewer gas pains, and a generally less stormy convalescence.

Cerebral Hemorrhage of the New-born.

IRVING (*Boston Medical and Surgical Journal*, May 26, 1921) states that cerebral hemorrhage is undoubtedly the most common cause of death in the first week of infancy. Warwick found it present in 50 per cent of autopsies on the still-born and the new-born, and Spencer in 40 per cent. In over 12,000 consecutive births at the Boston Lying-in Hospital the diagnosis of cerebral hemorrhage was made in 41 cases, which is about once in 300 deliveries. This figure gives no proper idea of its frequency, as only those cases have been considered which were proved by autopsy or in which, during life, the signs of intracranial bleed-

ing were unmistakable. Still-births, and deaths from asphyxia, or from unexplained causes, were not included.

We now know there are at least three ways in which cerebral hemorrhage of the new-born may originate. These are: (1) from intrauterine asphyxia; (2) as one of the many manifestations of hemorrhagic disease of the new-born; and (3) from the trauma of either operative or spontaneous delivery.

Intrauterine asphyxia results from some mechanical obstruction to the fetal circulation.

During labor we have a retraction of the muscle fibers of the uterine wall, which, if allowed to continue indefinitely, will result in tonic contraction of the organ. Should the membranes rupture early, this retraction is especially marked. It occurs at the placental site, as well as in the other portions of the uterus, and the result is a slow diminution of the blood supply to the fetus. Impaired oxygenation causes an asphyxia which so raises the fetal blood-pressure that cerebral apoplexy is the result. Over 25 per cent of cases at the Lying-in Hospital had a first stage which lasted over twenty-four hours. Had this been shortened by appropriate measures the author believes that many of these babies would have been saved.

The forceps have been blamed many times as the cause of cerebral injury, when had they been used earlier the injury might have been avoided.

In another 25 per cent of the author's cases, cerebral hemorrhage was apparently but part and parcel of hemorrhagic disease of the new-born. In these cases hemorrhages were found in regions of the body other than the cranial cavity. Moreover, eleven cases of cerebral hemorrhage followed normal or precipitate delivery, and one followed Cæsarian section. In none of these was the trauma of delivery or asphyxia present. We are therefore led to the conclusion that these cases were due to hemorrhagic disease, since the other two causative factors were lacking.

The trauma of delivery may cause rup-

ture of the cerebral vessel with resulting extensive hemorrhage. Compression exerted by forceps applied to an unfavorable diameter of the fetal head, as well as the sudden change in intracranial pressure when either the forecoming or the aftercoming head is violently pulled through either the superior or the inferior strait, may result in much damage. The author believes that the only safe application of forceps is over the sides of the baby's head. In this case, when a properly designed instrument is used, and there is no disproportion between the child's head and the mother's pelvis, the forceps tend to protect the skull rather than to damage it.

The diagnosis of cerebral hemorrhage of the new-born is a matter of the greatest importance. The immediate mortality is excessively high, in the author's series 95 per cent, both with and without operation. Since these children, should they survive the first few days of life, are apt to become the victims of cerebral paralyzes or degenerate into hopeless idiots, it is absolutely necessary that the condition should be recognized immediately, and every attempt made to prevent such a disastrous outcome. These babies, in the early hours or days of life, exhibit certain peculiarities which should not fail to attract the attention of the physician. They may have recurrent attacks of cyanosis and apnea, often without any other visible abnormality.

This is especially apt to be the case in the subtentorial hemorrhage, where the extravasated blood causes an increase of pressure on the medulla, and results in respiratory symptoms. In these cases lumbar puncture will reveal bloody spinal fluid, and often the condition of the child will improve strikingly, for a time at least, upon the relief of pressure by this procedure. One of the author's cases was, so far as he knew, cured by repeated lumbar punctures. It left the hospital in good condition, and was normal in every way four months later.

In other cases there is little to be noted at first, except that the child does not seem quite right. It refuses to nurse and often

has a characteristic, continuous and monotonous cry. Sometimes, on the contrary, it lies quietly and is difficult to arouse. As time goes on, nystagmus, inequality of the pupils, twitching, convulsions, and spasticity of the extremities develop, and there may be retraction of the neck or opisthotonos. The anterior fontanel is apt to show a varying degree of bulging, depending upon the degree of intracranial pressure. In massive hemorrhages pallor is a striking sign.

If there is any question of intracranial hemorrhage, a lumbar puncture should be done. The anterior fontanel may also be aspirated with a needle and syringe, avoiding the midline under which lies the superior longitudinal sinus. Naturally this procedure will be negative unless the extravasated blood lies beneath. The coagulation and bleeding time should be determined by Rhodda's method, and if they are prolonged, or if hemorrhages are apparent in other regions of the body, repeated subcutaneous injections of about 30 Cc. of whole blood should be made on the assumption that the intercranial bleeding may be due to hemorrhagic disease. In the writer's experience transfusion has only hastened the fatal termination, since the rise in blood-pressure which results from it has only increased the hemorrhage. Should the diagnosis of intracranial hemorrhage be made, a surgeon skilled in the treatment of cerebral injuries should be called immediately in consultation. The cases operated on have done badly. In all of them, except one, either an extensive bone-flap operation was done, or the anterior fontanel was opened. Should these infants survive the operation, which is rare, hydrocephalus or hernia cerebri is apt to result.

The operation which seems to offer the most hope is the subtemporal decompression. The surgeon's effort should be solely to relieve tension. Search for bleeding points, except when there has been a tear in a single large vessel, such as the superior longitudinal sinus, will be fruitless and a waste of valuable time.

In this condition prophylaxis is all-important. The fetal heart should be under

close observation during the entire first and second stages, and the obstetrician should stand ready to terminate labor, should it show any alarming variation.

Symptomatology and Diagnosis of Foreign Bodies in the Air and Food Passages.

CHEVALIER JACKSON (*American Journal of the Medical Sciences*, May, 1921) reports on 789 cases in gratifying and instructive detail. He thus summarizes the chief points of his admirable paper:

Foreign bodies lodged in the larynx cause an initial laryngeal spasm which is followed by more or less laryngeal wheezing, croupy cough, and a variable degree of impairment of phonation. Pain in the laryngeal region may be present and is sometimes referred to the ears. The larynx may tolerate a thin, flat foreign body for a relatively long period of time, but the development of increasing dyspnea renders early removal imperative in the majority of cases.

Tracheal foreign bodies are usually movable, and their movements can usually be felt by the patient. The vibrations may be palpated and heard with the stethoscope. Cough is usually present at once, may disappear for a time and recur, or may be continuous, and may be so violent as to induce vomiting. Sudden shutting off of the expiratory blast and phonation during paroxysmal cough is almost pathognomonic of a movable tracheal foreign body. Dyspnea is usually present and is due to the bulk of the foreign body plus the subglottic swelling caused by the traumatism of the shiftings of the intruder. The asthmatoïd wheeze is usually present and is often louder and of lower pitch than the asthmatoïd wheeze of bronchial foreign bodies. It is heard at the mouth, not at the chest wall. Pain is not a common symptom, but may occur and be accurately localized by the patient.

Early symptoms of irritating foreign body (such as a peanut-kernel) in the bronchus manifest themselves by initial

laryngeal spasm almost invariably present with foreign bodies of organic nature such as nut kernel, peas, beans, maize, etc. A diffuse purulent laryngo-tracheo-bronchitis develops within twenty-four hours in children under two years. Fever, toxemia, cyanosis, dyspnea, and paroxysmal cough are promptly shown. The child is unable to cough up the thick mucilaginous pus through the swollen larynx and may "drown in its own secretions" unless the offender be removed.

Lung abscess rapidly forms. The older the child the less severe the reaction. In the early stages an acute obstructive emphysema is present, manifested by: (a) Limited expansion; (b) muffled tympanitic percussion note; (c) markedly diminished or absent breath sounds on the obstructed side; (d) many râles and harsh breathing on the free side. The radiograph confirms these signs by showing (a) greater transparency on the obstructed side; (b) displacement of the heart toward the free side; (c) depression and limitation of the diaphragmatic movement on the obstructed side. The time of inhalation of a foreign body may be unknown or forgotten. Cough and purulent expectoration ultimately result, although there may be a protracted delusive symptomless interval. Periodic attacks of fever, with chills and sweats, and followed by increased coughing and the expulsion of a large amount of purulent, usually more or less foul material, are so nearly diagnostic of foreign body as to call for exclusion of this probability with the utmost care. Emaciation, clubbing of the fingers and toes, night-sweats, hemoptysis, in fact all of the symptoms of tuberculosis, are in most cases simulated with exactitude, even to the gain in weight by an outdoor regimen.

Tubercle bacilli have never been found in the bronchoscopic clinic associated with foreign body in the bronchus. It was the only element lacking in a complete clinical picture of advanced tuberculosis. A point of difference was the rapid recovery after removal of the foreign body.

The erroneous statement in all of the

text-books that foreign body is followed by phthisis pulmonalis is an heirloom of the days when the bacillary origin of true tuberculosis was unknown, hence the foreign body phthisis pulmonalis or pseudotuberculosis was confused with the true pulmonary tuberculosis of bacillary origin.

The subjective sensation of pain may allow the patient to localize a foreign body accurately. Foreign bodies of metallic or organic nature may cause their peculiar taste in the sputum. Offensive odored sputum should always suggest bronchial foreign body; but absence of sputum, odorous or not, should not exclude foreign body.

Sudden complete obstruction of one main bronchus does not cause noticeable dyspnea provided its fellow is functioning. Complete obstruction of a bronchus is followed by rapid onset of symptoms. The pleura is rarely involved. Rib resections done for supposed empyema have with one exception shown no pus. The physical signs usually show limitation of expansion on the affected side, impairment of percussion, and lessened transmission or absence of breath sounds distal to the foreign body. The "asthmatoïd wheeze" may, if present, be of great diagnostic value. Its absence, however, does not negative the presence of foreign body.

All cases of chest disease should have the benefit of a radiographic study to exclude bronchial foreign body as an etiological factor, and negative opinions should never be based upon any plates except those of the utmost perfection that the wonderful modern development of the art and science of roentgenology can produce. In doubtful cases the negative opinion should not be conclusive until a roentgenologist of long and special experience in chest work has been called in consultation. Even then there will be an occasional case calling for diagnostic bronchoscopy.

Symptoms of pulmonary abscess, or other lung disease, even cough, following within a few weeks of the extraction of teeth, call for exclusion of foreign body in the lung.

There are no absolutely diagnostic symp-

toms of esophageal foreign body. Dysphagia, however, is the most constant complaint, varying in degree with the size of the foreign body and the degree of inflammatory or spasmodic reaction produced. Pain may be caused by the penetration of a sharp foreign body, by inflammation secondary thereto, by impaction of a large object, or by spasmodic closure of the hiatal sphincter. The subjective sensation of foreign body is usually present, but cannot be relied upon as assuring the presence of a foreign body, for it is present for a time after the passage of the intruder. All of these symptoms may exist, often in most intense degree, from previous violent attempts at removal, and the foreign body may or may not be present. Fluoroscopic study of the swallowing function with barium mixture or capsule will give the location of a foreign body which may not be radiopaque. Anteroposterior and lateral roentgenograms should always be made.

The value of a radiograph after the removal of the foreign body cannot be too strongly emphasized.

Foreign body in the stomach ordinarily produces no symptoms. The roentgenogram and the fluoroscopic study with an opaque mixture are the chief means of diagnosis.

Gastric Ulcer and its Treatment.

MOYNIHAN (*Medical Record*, May 28, 1921) under this title, with his customary happiness of expression, lucidity of thought, and efficiency of action, observes that the stomach is marked off from the duodenum by the pyloric vein and the pyloric white line so distinctly that the possibility of a mistake is certainly less than 10 per cent. Ulcers occurring so near to this upper line as to be entitled to the term "pyloric" form almost 1 per cent of ulcers of the stomach or duodenum. Ulcers on the proximal side are "gastric," those on the distal side of the boundary are "duodenal." There are five duodenal ulcers for every two gastric ones. Gastric ulcers are twice as common in men as in women. The chief symptom

is pain. The chief attribute is regularity. There are periods of intermission longer or shorter, at one period of the year or another; but when the attacks are present the pain, which is then the chief complaint, always displays regularity. It comes after all meals, even light meals; and day after day during the attack. If during the attack a meal is eaten, pain invariably follows. The interval between the taking of the meal and the onset of pain is fairly constant. As a rule the earlier the pain is felt after a meal the nearer is the ulcer to the esophagus. That is to say, if pain comes regularly in one hour or one hour and a half, the ulcer that causes it is in the stomach; it is a prepyloric ulcer. If the pain comes two, three, or four hours after the meal the ulcer lies generally beyond the pylorus. This period of relief of pain after a meal is constant and invariable both in gastric and duodenal ulcers, until stenosis, subacute perforation, or the formation of crippling and embarrassing adhesions takes place.

Where the gastric ulcer simulated duodenal ulcer it was often noted the pain came within one and a half hours of the taking of food; in rather more than four cases in five of duodenal ulcer the pain appeared in two hours or more after food. In most of these the pancreas was eroded. The pain in cases of gastric ulcer often disappears in an hour or less, and may be completely relieved—indeed it generally is before the next meal is due. The pain of duodenal ulcer appearing later generally persists, often with a slowly increasing severity, after the meal is taken. The character of the meal influences the pain. A generous meal of heavy foods causes severe pain to appear at an earlier time in gastric ulcer; it delays the appearance of pain in the case of duodenal ulcer. Smaller meals of soft, pultaceous food, easy of digestion and easily propelled, produce less pain, and the interval of relief brought by the food is longer. An indiscreet and hasty meal, especially of fruits, or salads, or pastry, may give instant and grievous pain.

A bland and blameless diet taken in small quantities at brief intervals may reduce the chances of pain appearing or even afford complete relief. In the majority of cases in which there was pain it was said to be on the left side or high in the epigastrium; in some severe types there may be great complaint of pain in the back. In twenty-three cases in which there was a deep excavation in the pancreas consecutive to a subacute perforation of the ulcer on the lesser curvature or posterior wall of the stomach, seventeen patients complained bitterly of the intolerable aching in the back.

About four-fifths of the patients who are found to have gastric ulcers complain not only of pain, but of great prostration, feebleness, or lassitude coming on just at the time when the pain is due. This distressing symptom may be found to have preceded the experience of pain by weeks or months. The periodicity of the two is identical.

Moynihan particularly insists upon the importance of ascertaining the various modifications of the one symptom, pain, the constancy of the sequence—food, comfort, pain, comfort; food, comfort, pain, comfort—is the most important of all the clinical matters concerned with the diagnosis of gastric ulcer. In duodenal ulcer the rhythm is food, comfort, pain; food, comfort, pain, and so on.

Moynihan states that when in the record of any patient suffering from "dyspepsia" there is a story of frequent vomiting of the foods, or even fluid nourishment sparsely taken at once rejected, the thought that gastric ulcer is the cause should be driven from one's mind. The type of history which is commonly heard is rarely present in cases of organic disease of the stomach. The vomiting due to the presence of an ulcer is infrequent, and occurs almost always not immediately after food, but after a shorter or longer interval. The meal at first causes relief, and only after that period of relief does it cause disturbance.

Hematemesis also occurs far less commonly than is supposed. Hemorrhage manifest as melena, or in the vomit, is recorded in less than 25 per cent of cases; in the majority of these the amount of blood lost was trivial, and in many in which "hematemesis" is recorded it is at least doubtful whether blood was in truth present.

When blood is discharged from the stomach either in a fresh state or as "black vomit," it is commonly believed that a chronic ulcer is present. There is a great fallacy in such opinions. That gastric hemorrhage occurs, and occurs profusely, in ulceration both of the stomach and duodenum, is certain; but the number of other conditions that give rise to hemorrhage is so large that the possibility of a gastric ulcer being the source of the blood should not be strongly or exclusively held. For when a patient dies of such hemorrhage a very close examination of the gastric mucosa may reveal the existence of tiny chaps, or cracks, or fissures from which blood has certainly issued. And when in the old days of unwisdom we operated upon such patients and explored the cavity of the stomach the mucous membrane was said to "weep blood;" little trickles of blood could be seen to issue from many points. But these little gaps in the mucosa are not ulcers of the kind that produce symptoms. If a patient has suffered for months or years from dyspepsia, and then is seized with an acute attack of vomiting and hematemesis, and if an operation urgently performed reveals the condition of the mucosa just described, it is the worst of fallacies to connect the dyspepsia with the "ulcer" or ulcers then supposed to be present in the stomach. The ulcer which has caused repeated attacks of indigestion is always a gross lesion, a lesion in which there are present not only the evidences of destruction, but also of defense; around the crater of the ulcer is an area, greater or less, of inflammatory action, and the serous coat of the stomach is plainly involved. If the breaches of continuity which permit the

escape of blood in cases of cirrhosis of the liver, splenic anemia, and the toxic conditions which, as a rule, have their origin within the abdomen, are called "acute ulcers," as they often are, it is essential to remember that such ulcers are recognizable by no other clinical evidence than hemorrhage, or in exceedingly rare instances by perforation; they are never the cause of a continuing or recent dyspepsia.

The radiographic method is, in expert hands, the one certain method of diagnosis, and is now an indispensable addition to the older and far less accurate methods of inquiry.

If, for example, a patient has had a type of dyspepsia which has led to a diagnosis of gastric ulcer and an operation is performed, the stomach may show no scar, nor can any examination, however careful, display the ulcer whose presence was predicted. If, however, the stomach is closely inspected before it is handled, the following conditions may be seen: the pyloric part of the stomach is decidedly redder than natural—there is a "pyloric blush." That part of the stomach is soon observed to contract eagerly and vigorously; sometimes the spasm is so severe and so prolonged that there may be a suspicion of a tumor, but by degrees the spasm relaxes and the parts become supple again. The spasm may be irregular, now at one part, now at another; now slow and deliberate, now fugitive. Along the greater curvature the glands are enlarged. When these three conditions are seen the prophecy may be confidently made that the stomach is healthy and that the appendix (or one of its neighbors in the alimentary canal) is diseased. In such cases gastroenterostomy has often been performed, sometimes, it is curious to note, with benefit, but as a rule with disastrous effects.

The stomach is an organ full of sympathy for other sufferers. Hardly any of the viscera connected with the intestine, or the bowel itself, can be affected without the stomach playing its part in the disturbance also. This it does by pouring out an excess

of secretion and by tumultuous and irregular activities. It speaks so loudly that its voice only is heard. Its tears of sympathy are spoken of as hyperchlorhydria.

The surgical treatment of a chronic gastric ulcer may call for the performance of any of the following operations: Gastroenterostomy; excision; gastroenterostomy combined with (a) excision, (b) cauterization (Balfour); gastroenterostomy combined with jejunostomy (Moynihan); median resection of the stomach—"sleeve resection;" partial gastrectomy.

Moynihan's choice of operation now always falls upon partial gastrectomy, whenever it can with reasonable safety be performed. The risk is not great: over a period of ten years it is less than 2.5 per cent. All things considered, and account being taken of the five years succeeding operation, it is probably a safer operation and is certainly more immediately satisfactory than gastroenterostomy alone. It cannot always be practiced. The condition of the patient may forbid it. The ulcer may be so large and so placed as to make removal a matter of so great technical difficulty that the immediate hazards are unfair to the patient. But as experience grows the number of such cases diminishes.

The details of the operation of gastrectomy are briefly these: The duodenum is divided just beyond the pylorus, after ligature of the pyloric and gastroduodenal arteries. An opening is made in the transverse mesocolon, in the arch of the anastomosis of Riolan, in order to guide the surgeon in his ligature of the omentum below the greater curvature, so that the middle colic artery may be avoided, and in order that the conditions at the back of the stomach may be early and fully investigated. After division of the great omentum as far toward the left as the point at which the stomach is to be divided, the whole organ is turned over to the left edge of the parietal wound, until the coronary artery is brought into view and ligatured with great ease at exactly the place required. As soon as this vessel is cut an

anchor is "let go," and the stomach is moved more freely. Then, while the stomach is held as a retractor, an anastomosis is made between it and the jejunum. Moynihan now always applies the end of the stomach to the side of the jejunum.

In his early cases he twice encountered a little difficulty in making the jejunum so apply itself to the stomach as to avoid a kink at the upper end of the anastomosis. In both cases some bilious vomiting occurred. In order to prevent this he now usually divides the jejunum completely across, about 6 or 8 inches below the duodenojejunal flexure, closes the distal end, applies the side of the closed distal end to the cut end of the stomach, and then unites the proximal end to the side of the distal end about 4 inches below the stomach, thus making an anastomosis in "Y." This takes a few minutes longer, but the expenditure of time is worth while. Time is saved when the stitches which close the opening in the mesocolon are applied round the suture line; by this method they are easily and quickly inserted. The results are excellent. The condition after operation is remarkably good; in almost all cases the patients have the most tranquil progress that one could wish. And not one single case he has ever operated on has had a recurrence of the ulceration. Once the convalescence is complete the history is without incident.

Postoperative Morbidity in its Relation to Anesthesia:

Anesthesia was for years accepted as an unqualified boon to humanity, so that little attention was paid to its comparatively small morbidity or mortality. That there were unfortunate results attributable directly to the anesthetic is generally acknowledged, and as different anesthetics were discovered and employed upon a large number of patients it was observed that mortality and morbidity were greater for some than for others. Thus as a result of clinical experience ether gradually replaced chloroform, and incident, however, to not only clinical

evidence, but to careful biochemical studies, ether is being replaced by nitrous oxide and local anesthesia.

In this relation THOMPSON (*Edinburgh Medical Journal*, June, 1921), reviewing the whole subject in its present phases, observes that nausea with or without vomiting constitutes the most frequent morbid state following general anesthesia.

The question as to whether postoperative nausea and vomiting have a causal relationship with acidosis is important practically. If the reduction of the alkali reserve is the cause of the nausea and vomiting, the administration of bicarbonate of soda in sufficient quantities previous to operation should obviate the condition. The reduction in the alkali reserve is in the majority of cases a temporary one.

Experience with cases in which bicarbonate of soda has been administered as a routine measure for forty-eight hours preceding operation points fairly strongly to the presumption that the incidence of nausea and vomiting is thereby reduced.

There can be little doubt that, although the cause of the vomiting, etc., is probably of central origin, an excessive secretion of mucus and saliva must at least aggravate the tendency to vomit. Adequate administration of atropine will obviate this in the great majority of cases. Morphia also will help by reducing the amount of the general anesthetic required, and, by calming the patient, will facilitate a smooth induction.

It is generally admitted that a nitrous-oxide-oxygen anesthesia, with or without the judicious addition of ether, is followed by less postoperative nausea and vomiting than is the case after the use of ether or chloroform.

It will be readily admitted that in the absence of a careful attention to detail the patient is liable to be subjected to distinct risks of chilling and depression of vitality, and that one of the effects of this, especially in a person predisposed to chest trouble, may be the development of a patch of pneumonia, or congestion, or a bronchitis. Having granted this, there can be little doubt that the anesthetic does play a part

in postoperative chest conditions, and that in this connection ether is the agent most to be feared.

It would seem to be important: (1) To hesitate before giving ether for any time to a patient suffering from or who has recently suffered from such lung trouble as bronchitis. (2) To be sure that the ether is pure and prepared for purposes of anesthesia. (3) To guard against the possibility of chill.

The most important aspect of the question of postoperative morbidity in its relation to general anesthesia concerns itself with the part played by the general anesthetic in those cases in which there is a greater or less degree of shock at the time of the commencement of the operation, or in which, through the severity of the operation or a complication such as hemorrhage, shock becomes established.

Acidosis in the sense of a simple reduction of the bicarbonate of the blood plasma is not the cause of shock or an important factor in its production.

The progressive uncompensated fall in the alkali reserve is a symptom of a deficient capillary circulation and not a cause of such.

The progressive underlying factor in the pathology of surgical shock is a prolonged and progressive fall in blood-pressure.

The causes which may inaugurate the fall of blood-pressure are various: some are nervous, some clinical. Hemorrhage and the absorption of toxic products from injured tissues are powerful collateral and sustaining factors in the production of shock.

Cold is probably an important factor in effecting a delay in the capillary situation, and when long continued it depresses all the body functions.

With the establishment of a low blood-pressure, something of the nature of a vicious circle comes into play. The prolonged hypotension leads to suboxygenation of the body tissues, and a capillary stasis. The capillary stasis reduces the amount of circulating fluid, and the suboxygenation of the tissues results in the appearance of various toxic products from imperfect

tissue metabolism. All of these collectively further reduce the blood-pressure, and so the vicious circle goes on. It will continue to a fatal issue unless some link in the chain is broken and the error of the blood-pressure overcome.

In a series of cases reported by Cannon, of men operated upon whose CO_2 capacity was below 50 per cent at the time of operation, or below it at the end of anesthesia, "the average drop in CO_2 capacity at the end of operation was twice as great as that reported by Caldwell and Cleveland in ordinary civil cases. The fall was greater, too, the lower the original capacity. In other words the more marked the acidosis, the more sensitive is the patient to operative procedures, and the more likely is he to be let down by them into a region of danger. Also there was a striking fall of blood-pressure as the result of operation in these cases."

Crile experimentally found that under approximately equal trauma the changes in the brain cells were approximately three times as great under ether as under $\text{N}_2\text{O-O}$ anesthesia. Whatever view one takes of the brain-cell changes referred to, it is justifiable to take them as an index of the blood-pressure in the brain. Crile also found that the fall in blood-pressure was on the average two and a half times greater under ether than under $\text{N}_2\text{O-O}$, and that the condition of the animal was worse after trauma under ether than after equal trauma under $\text{N}_2\text{O-O}$ anesthesia.

He concluded, therefore, that while the brain-cell changes resulting from a surgical operation are not due to the inhalation anesthetic *per se*, yet their extent is to a considerable degree determined by the anesthetic which is used. As these changes are less marked under $\text{N}_2\text{O-O}$ than under ether, the former should be the inhalation of choice.

Cannon, in the summary of his paper on acidosis in cases of shock, etc., states that "operation on men suffering from shock and acidosis results in serious and rapid sinking of arterial pressure when it is already low, and a marked and sudden de-

crease in the alkali reserve of the blood when that reserve is likewise already low. This change may not occur if $\text{N}_2\text{O-O}$ anesthesia instead of ether is employed, but that anesthetic affords no guarantee against the ominous decline."

If one accepts these findings one is justified in concluding:

That the anesthetic *per se* is capable of adversely affecting the condition of the patient in operative procedures on shocked patients.

That the choice of the anesthetic agent used may be a matter of importance. The latter conclusion involves the question of the superiority of $\text{N}_2\text{O-O}$ anesthesia in such cases, at any rate over such general anesthetics as ether and chloroform.

Any one who has read Cannon's work on "The Bodily Changes in Fear, Hunger, Pain, and Rage," will realize what a profound effect such emotions as fear and pain may have on the secretions of the body. Biologically considered, such effects are protective, but in the abnormal conditions of a patient about to be operated on this result on the patient may be very harmful. Crile was among the first to emphasize the importance of the emotional factor, and to insist on the necessity of avoiding its operation as far as possible.

The treatment aimed at accomplishing this is simple enough, and consists in a general way of reassuring the patient, treating him with gentleness and consideration, and in dulling his sensibility by such drugs as morphia and scopolamine. As Crile puts it, "No detail is too petty."

By the preoperative administration of sodium bicarbonate the alkaline reserves of the body can be greatly increased even in unfavorable circumstances. Since acidosis develops in shock and involves a definite risk when operation is undertaken, its avoidance should be sought. The recommendation is offered that wounded men be provided with a warm drink containing a drachm or 4 grammes of sodium bicarbonate at suitable relay posts on their way from the front to casualty clearing stations.

Further, when an alkaline injection is

given at the start of an operation "it prevents the dangerous depressive effects which the anesthetic and operative procedures have on cases of shock with acidosis. The operation ends not with an increase of the existent acidosis, but with the acidosis overcome and a normal alkaline reserve provided, and the blood-pressure instead of being lowered is actually raised during the critical period."

With regard to the measures for restoring an efficient circulation, certain points may be noted: Transfusion of whole blood is probably the measure likely to have a successful result in the largest proportion of cases, provided its application is not unduly delayed.

The Mobile V Colon.

DR. ELIZA MOSHER (*New York Medical Journal*, May 18, 1921) under this title describes certain deviations of the colon due to weakness of the abdominal walls and to other conditions which favor general visceroptosis. It is stated that the condition is not difficult to diagnose. The author summarizes her article as follows:

A more or less acute angle is liable to form in any part of the transverse colon where there is localized weakness of the abdominal wall. Because this bend resembles the letter V it has been termed the V colon.

In moderate degree this bend is of common occurrence—in extreme degree, occasional.

Its consequences are far reaching. It slowly undermines the health by causing stasis in the bend and in the section of colon behind it.

Recognition of the V colon is easy by auscultation percussion, but more difficult with bismuth enema, because of the tendency of the latter to mechanically straighten the bend as it fills the transverse colon.

Temporary correction by slow, sighing expirations, elevation of legs, and other measures can be quickly accomplished.

Permanent correction can be made by applying a simple supporting belt, and by the faithful and persistent use of exercises cal-

culated to draw the recti muscles together and to strengthen the entire musculature of the abdominal wall.

The Treatment of Surgical Tuberculosis in Children by Venous Hyperemia.

In a leading article in the *Medical Record* of June 11, 1921, this question is set forth as follows:

In children the induction of venous hyperemia is not only quite equal to any other modern method of treatment of white swelling of the knee-joint, with the exception of heliotherapy, but it is distinctly superior in many respects. The rapid sedation of pain is one of the first results when the procedure is properly employed. The bed position assumed by the involved limb improves spontaneously as soon as the pain disappears. The possibility of carrying out the treatment without the use of casts or other means of immobilizing the limb avoids the development of trophic disturbances of the skin, muscles, and bone. Finally, when other therapeutic measures—always excepting heliotherapy—usually end in more or less complete ankylosis (which is even yet regarded as an ultimate aim), venous hyperemia preserves the joints as well as their movement, and this is not uncommon, but almost invariably the rule. Therefore it should be given a high place in infantile surgical therapeutics in which conservative measures are all-important. Added to these advantages treatment by venous hyperemia is absolutely inoffensive when rightly carried out.

The accidents attributed to it are invariably due to a defective technique. Muscular atrophy at the point of application of the elastic band, chronic edema, and, exceptionally, gangrene have been recorded, but they are always the result of a too tight application of the band. Acute suppuration in the sinuses or in tuberculous abscesses may also ensue from the ischemia caused by a too tight ligature, and tuberculous lesions appear to be particularly aggravated by this ischemia or by an exaggerated edema which produces a too in-

tense or prolonged stasis. Consequently it is of the utmost importance to watch for the slightest symptoms accruing from too energetic compression and to remedy this immediately. For this reason the simultaneous application of the elastic band and cups should always be avoided as they produce an excessive stasis over the bacillary lesion itself.

As to the manner of action of venous stasis one is reduced to hypotheses, each of which probably has a certain value, but no one taken singly is sufficient to give a satisfactory explanation. It must be admitted that the true *modus operandi* of the procedure still remains to be explained, but the

numerous excellent—even exceptional—results plead in its favor. Its use is indicated at the onset of white swelling of almost any joint when the lesions are especially in the periarticular soft parts, and in osteitis with or without sinuses, when the bone lesion is superficial. Venous hyperemia can also be used to complete the results of a surgical interference on the bones. Like all other conservative measures this one is contraindicated in very advanced tuberculous lesions of the bones and in rapidly developing osteoarthritis, when it is desirable to prevent the occurrence of visceral degeneration by resorting at once to a radical operation.

Reviews

THE OXFORD MEDICINE. Edited by Henry A. Christian, A.M., M.D., and Sir James Mackenzie, M.D., F.R.C.P. Six volumes, illustrated. Volume IV. The Oxford University Press, New York and London, 1921.

In previous issues we have called attention to the preceding volumes. The fourth volume has just come to hand and deals with diseases of the lymphatic system, metabolism, the locomotor apparatus, industrial diseases, and infectious diseases. A surprisingly large number of American authors have taken part in the preparation of this volume; among them being Riesman, Sailer and McCrae of Philadelphia, Joslin of Boston, Rowntree of Minneapolis, and Miller of Chicago. The articles upon Cholera and Malta Fever are by Heiser, and one better qualified could not have been found. In the treatment of typhoid fever we are glad to note that Dr. Miller emphasizes the importance of a liberal diet in place of the scanty diet which a few years ago was so commonly followed. We note with interest his statement that the rigid Brand method of treating typhoid fever is used only to a very limited extent in this country and that modified hydrotherapy is quite gen-

erally applied. Again we note with a good deal of interest his statement that we do not possess evidence of the beneficial results of the Brand bath. We had supposed that there were few therapeutic measures which have so large an amount of information attached to them of a reliable nature. The whole point in regard to the Brand bath, as we have repeatedly pointed out, is not so much the temperature of the water or the immersion of a patient in the tub as it is the establishment of circulatory equilibrium and reaction by the proper use of water at different temperatures according to the patient's needs.

Naturally, considering the amount of work which Dr. Miller has done in connection with the action of foreign proteins, he devotes some space to this subject and its application to typhoid. We are glad to see that he maintains a rational attitude concerning it, stating that it should be used with great caution, and that if further observations show that it lowers mortality and is free from danger, it will be a definitely valuable therapeutic agent.

The volumes of Oxford Medicine, it will

be remembered, are bound in such a way that additional pages can be rapidly inserted by the purchaser when additional information due to the advance in medicine comes to hand.

We think that Volume IV is the most satisfactory of the series, so far as usefulness is concerned.

THE INTERNATIONAL MEDICAL ANNUAL. A Year-book of Treatment and Practitioners' Index. William Wood & Company, New York, 1921. Price \$6.

This is the thirty-ninth year in which the International Medical Annual has appeared, and our readers will recall that for all of these years the GAZETTE has called their attention to it. It is made up of abstracts prepared by different physicians and surgeons in this country and abroad, the majority, of course, being English.

It opens with an introduction by the editor, whose name, curiously enough, does not appear on the title page, although the names of the associate editors so appear. Following this, Professor Charteris of St. Andrews provides, in the brief space of thirty-nine pages, a summary of therapeutics for the past twelve months.

As in previous years the remaining portion of the volume consists in abstracts from current medical literature arranged in alphabetical order, beginning with abdominal surgery and ending with yellow fever.

An appendix dealing with orthopedic surgery, prepared by Drs. Albee and Carter of New York, closes the volume, their manuscript having been delayed in transit from the United States so that it could not be placed in its regular position.

A MENTAL HOSPITAL MANUAL. By John MacArthur, M.R.C.S., L.R.C.P. Oxford University Press, New York and London, 1921. Price \$5.25.

This is a book of 215 pages which is definitely described in its title. In other words, it is an endeavor to place before junior medical officers in mental hospitals or insane asylums those methods of treating the insane which experience has proved

to be satisfactory. The author claims that nothing in the way of treatment has been recommended which has not stood the test of experience, and he well points out that the practice of medicine in such an institution is very different from the practice of medicine amongst those who are mentally competent. He begins with a chapter upon the Mental Hospital, as he calls it, and then proceeds to a consideration of the Duties of the Assistant Medical Officer, devoting his third chapter to the Treatment of the Insane, including physical as well as medicinal remedies, a subject which is continued in his fourth chapter. In the fifth chapter he deals with the surgical conditions which may arise in the insane, and then proceeds to discuss the care of patients with defective habits, the discharge of patients apparently cured, and lastly, in chapters twelve and thirteen, he discusses the English laws governing insanity, the statutory books and laws, the character of evidence to be taken by medical officers at inquests, and the forms which should be used in meeting the law in connection with autopsies and the reporting of deaths. In this portion of the book schedules and forms best suited to hospital management for the insane are also included. The book is one which will prove valuable and interesting to those who are devoting themselves to this line of work.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. Third Series, Volume II. ARNAL-BLONDOT. Government Printing Office, Washington, 1920.

This is the second addition to the alphabetical list of abbreviations of titles of medical periodicals published in the twenty-first volume, second series, of the Index Catalogue. The Catalogue is known in scientific circles all over the world as being one of the most important contributions to science, with particular reference to medicine, that has ever appeared in any land. We learn from the letter addressed to the Surgeon-General by General Noble of the Medical Department of the Army that this second volume of the third series of the Index Catalogue represents 2644 volumes, 4389

pamphlets, and 29,504 titles of articles in periodicals. We also learn that the Library of the Surgeon-General's Office now contains 198,900 bound volumes, 35,092 unbound volumes, and 361,455 pamphlets, together with 56,031 portraits of physicians and 136 medical engravings and prints, and 316 medical caricatures. Exclusive of the Transactions of Societies, the number of current periodicals on file in the library is 1568, of which 1480 are kept upon the shelves in the reading room; and last of all, the encouraging information is given that through the opening of channels of communication with Germany and Austria most of the medical periodicals of those countries covering the years 1915-18 have been received and are being indexed as rapidly as possible. No medical periodicals have been received from Russia or the Balkan countries since our entry into the war.

A TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By John Glaister, M.D., D.P.H., F.R.S.E. Fourth edition, illustrated. William Wood & Company, New York, 1921. Price \$7.50.

The third edition of Dr. Glaister's well-known book appeared in 1915 and the second in 1910. In all these editions he received the assistance of Scottish lawyers who were best prepared to discuss problems of a medicolegal nature, and, therefore, the book may be said to be well rounded out in that its text has been prepared from two points of view. The material, which is new in the present edition, deals chiefly with industrial and other poisons, the relationship of toxicology to the responsibility for crime, and changes in lunacy laws. It contains a little over 900 pages and is provided with a very copious index. There is one colored plate and 137 illustrations, and by the use of unusually small type an immense amount of information is embodied, the small type being used in the description of typical cases and for other material which is not considered of first importance.

It is some time since any new work upon medicolegal matters has appeared in this country, and we can cordially recommend

this volume not only to those of the profession who occupy official positions in connection with medicolegal matters, but to those who may be called upon for ordinary or expert testimony in the courts.

PROSTHETIC DENTISTRY. By Douglas Gabell, L.R.C.P., M.R.C.S., O.D.S. Oxford University Press, New York, 1921. Price \$4.25.

In the space of less than 250 pages of rather large type with 58 illustrations, the author of this book gives fairly minute instruction as to the problems presented in the practice of prosthetic dentistry, including a consideration of the artistic anatomy of the lower part of the face and the details which are essential to successful work. The text is divided into eleven chapters. Needless to say it is essentially a book for dentists and not for physicians.

ESSAYS ON SURGICAL SUBJECTS. By Sir Berkeley Moynihan, K.C.M.G., C.B. Illustrated. W. B. Saunders Company, Philadelphia and London, 1921. Price \$5.

This series of essays collected in book form and most gracefully dedicated to W. J. and C. H. Mayo and his Friends at the Mayo Clinic, contains The Murphy Memorial Oration, The Ritual of Surgical Operation, The Diagnosis and Treatment of Chronic Gastric Ulcer, Disappointments After Gastro-Enterostomy, Intestinal Stasis, Acute Emergencies of Abdominal Disease, The Gifts of Surgery to Medicine, The Surgery of the Chest in Relation to Retained Projectiles, and The Most Gentle Profession, this last caption indicating, as might be expected, an address to the Nursing Staff of the Leeds General Infirmary on the distribution of prizes in January of this year, in which occur the words, "Gossip tainted with slander is the last and meanest infirmity of empty minds."

Probably with all of these papers every leading surgeon in the country is broadly familiar, nor is there one of this group who will not welcome the book as making readily available the teaching which he has learned to accept as authoritative, the writing which he recognizes as peculiarly clear and vivid.

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Original Articles

Uterine Polyps

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A uterine polyp has ever been one of the most dramatic and interesting affections in gynecology. I need not apologize, therefore, for introducing polyps once more to the profession, for I feel also a strong conviction that old subjects need reviewing now and then, that we may carry on that continual reëducation of the profession which is necessary in the vast field of modern medicine.

The immediate occasion of this writing was the appearance in my clinic of a remarkable polyp. Let me describe it: Miss P., aged thirty-nine, came to me in November, 1920, pretty well exsanguinated and complaining of a more or less constant bloody flow. Her general previous history was unimportant; she had menstruated at sixteen and was regular with no pain up to the present illness. Four years before a uterine hemorrhage had lasted for a couple of months; then in August, 1920, a profuse period lasted for three weeks, and was followed by a leucorrhea and a serous blood-stained discharge. When I saw her in November she had been flowing for six weeks excepting four days. An examination at once revealed the source of the trouble lying obviously right on the vulvar orifice, where there was a livid piece of flesh (see Fig. 1) 48 mm. long and 18 mm. wide in the cleft of the labia, soft and flac-

cid, ending in an attenuated pedicle 10 cm. long, which extended the entire length of the vagina and was attached to the cervix. The length of the whole growth, tumor and pedicle, was 16 cm. (Fig. 2). There was a fissure on the outer surface of the tumor, extending far into the tumor and lined with mucosa. The uterus itself was normal except for a retroflexion, and there was no lateral pelvic disease, so that the patient's whole disability quite certainly lay literally open and exposed to view.

The simple operation consisted in the ligation of the long thin pedicle on the left side of the cervix. Relief was immediate, and there has not been any return of the hemorrhages. The microphotograph shows clearly the benign nature of the growth (Fig. 3).

POLYPS IN GENERAL.

I use the term polyp in its general clinical and historic sense and not in an anatomico-pathological sense, to include all pedunculate mucous or fibrous tumors springing from the uterus or cervix, and covered with mucous membrane. They arise either from the mucosa of the uterus or of the cervix, or from the deeper layers of the uterus when they are fibrous or muscular. They vary greatly in size. The tumor shown in the photograph is large for a mucous

growth; its exceptional size is without doubt due to the fact that it is an aberrant form springing from the vaginal surface of the cervix. Sometimes a flattened mucous tumor some 3 cm. in length is found in the uterine cavity, especially when the uterus is occupied by large fibroid tumors. As a rule, however, mucous or soft (Osiander) polyps are much smaller. The habitat of these mucous growths by predilection is some part of the cervical canal, where they form pedunculate deep red masses as big as a small pea or a raspberry, which bleed

in mind, namely, that a polyp may show a beginning adenocarcinoma; this is a rare find, but its importance is obvious. The other thing is the liability of mistaking a so-called "polypoid endometritis" for a polyp. In the first place the term polypoid endometritis is a misnomer, for it is never an inflammatory condition; and in the second place it has nothing whatever to do with polypi. The differentiation is made by noting the abundance of material coming from the polypoid endometrium, while the true polyp is single, elongate, and smooth.

Another practical clinical grouping of polypi is into those which can be readily seen either at the vulvar orifice or in the vagina, and those which are concealed within the uterus. A polyp exposed to view readily indicates the source of a hemorrhage, but when the blood issues from the uterus and the cause of the hemorrhage is not obvious, there may be a number of possible explanations for the loss, many of them more likely than an intrauterine polyp, which is relatively rare.

A curious and still more rare form is the intermittent polyp which comes down into the cervix, becomes visible at the menstrual period, and then retires to invisibility within the uterine cavity again.

A brief review of the history of polyps is instructive, in that it recalls the difficulties under which our predecessors labored, and warns us not to repeat their errors, while filling us with a due sense of thankfulness for the advances made within the past half century. May I not interpolate that he who finds no time to feel and express his gratitude for our splendid acquisitions through the labors of our immediate predecessors, does not deserve to participate in the benefits inherited?

Polyps were well known to the ancients, who on occasion tied them off and removed the easier ones. Our active modern interest, however, began with the great French obstetrician Levret (1703-1780), the deviser of the well-known French lock, and who put the pelvic curve on the forceps, and who also pointed out the proper occasions for the use of the instrument. His book on

FIG. 1.—The large cervical mucous polyp hanging out of the vaginal orifice.

freely. Fibrous tumors on the other hand may attain a large size, even as big as a fist or much larger; an average size is that of an egg.

The mucous polyps are usually single, or at the most there are two. The fibrous polyp, while it is almost always single, is often but an outpost of a group of similar tumors in the body of the uterus. This is a matter of practical importance, for the discovery of one must lead to a search for others—that is to say, for a general myomatosis. Two things should also be borne

polyps appeared in 1749, and here his boldest attempt was to invent a forceps to enable him to throw a wax ligature around the pedicle of an intrauterine polyp. He applied a succession of ligatures as the first ones cut through the pedicle, until a large tumor sloughed and came away in a foul mass; injections of spirits of wine were used to sweeten the discharges. Levret wrote vividly and taught the leading young men of his century, his successors, and the interest awakened at this time never died out until all the problems connected with the subject were settled. We must remember that Levret worked without such excellent skilled coöperation of refined instrument makers as we can secure in our day, without an anesthetic, and without any satisfactory exposure of the field, and in constant dread of a fatal hemorrhage or of death from sepsis.

It was a far cry, almost a century, from Levret to Marion Sims, and in the meantime we find men resorting to a variety of expedients. Naturally in a condition so difficult and so dangerous to meddle with actively, medical means were constantly exploited; chief among these we find iron and ergot. Inasmuch as ergot was an "oxytoxic" it was reasonable to assume that it would also promote the expulsion of a polyp from the non-pregnant uterus, and under this vain assumption our forefathers gave tons of ergot, just as they gave all manner of pepsins by the ton to cure "dyspepsia." Much ingenuity was also spent in devising better means for slipping a ligature over the pedicle inside the uterus. The most important invention, however, and one which really did advance the methods of treatment, was the slow application of a linear crushing force by an instrument invented by the brilliant surgeon Charles Chassaignac, whose beneficent activities were crowded into the two decades in the middle of the last century. Chassaignac's *écraseur*, a powerful flexible chain-saw made of links, like a thin bicycle chain, was used extensively when I began practice in the early eighties, and I had one in my own armamentarium. The chain, thrown

like a loop of a ligature around the pedicle, was then shortened by a screw device until it cut slowly through the pedicle; usually without hemorrhage. The immense advantage of such a means of controlling a hemorrhage up in the uterus and out of sight at that early date is at once apparent. A great impetus was thus given by this invention both here and in many other fields of surgery. A more manageable means than the flaccid chains of embracing the

FIG. 2.—Shows the pedicle of the polyp attached to the cervix.

pedicle was soon found in a strong piano wire, which I also used in common with my contemporaries.

In the middle of the last century excision with scissors was also revived, being advocated by a no less eminent surgeon than Sir James Y. Simpson; occasional sharp hemorrhage was controlled by a tight pack.

The three great S's—Sims, Simpson, and Simon—hailing from America, Great Britain, and Germany respectively, at about the middle of the last century gave an unprecedented impetus to gynecology; in fact they may be said to have created the special-

ty. Sims's "Uterine Surgery," appearing in the sixties soon after the war, had a wide influence; in it we find ten pictures of polypi in all possible positions from cervix to fundus, and it is easy to see how the great surgeon revelled in the brilliant cures brought by his skill to these hopeless invalids.

The great advance in Sims's time was due to these several factors: the use of the sponge tent to open up and expose to touch the interior of the uterus; the use of an incision through the external os of the cervix when necessary to render the uterine cavity accessible to an operation; and the application of Chassaignac's *écraseur*. The ligature was rejected in simpler cases for torsion or excision with scissors. This was

as nature's own method of ridding the body of these tenants (Ramsbotham, 1853). T. Gaillard Thomas went so far as to invent and use a spoon with saw edges (his "spoon saw"), which though promising in its conception and appearance, proved disastrous in use, and was soon abandoned.

Anesthesia at this period allowed a better handling of the parts, and the vastly greater skill of our instrument makers was also an incalculable aid. With all this progress, however, the two cardinal dangers still lurked like spectres ready to destroy many lives; I refer to hemorrhage and sepsis.

We sometimes, too, took our chances in those early days, in view of the distressing condition of the patient. I well remember a woman (seen with Dr. Andrew K. Minich of Kensington, Philadelphia, in a way a father to me in my early work) in whom a large fibroid polyp completely filled the vagina, the pedicle could not be reached; I delivered it with an obstetric forceps, and was then able to attack the pedicle and remove it. Goodell had treated one in like manner, and so had J. Colvan in 1846. In Goodell's case it was necessary to incise the perineum to get the big growth out. With all the increased boldness, however, and the successes stimulating operators to greater efforts, there yet remained a great element of risk, making the intrauterine operations hazardous.

If immediate hemorrhage was controlled, there still remained the risk of a secondary hemorrhage (Herman, 1878): the dangers of sepsis were lessened, but now and then a patient was lost through an opening into the peritoneal cavity which was found inverted into the pedicle of the tumor, not to mention the occasional case in which an inverted uterus was itself mistaken for a fibroid polyp. A *cause célèbre* of this kind occurred in one of the big clinics in Germany. The distinguished professor while lecturing to his class on the dangers of just such a mistake, proceeded to operate, and on cutting through the pedicle of the tumor it was found to contain an inversion of the peritoneum, and the patient bled to death

FIG. 3.—A cross-section of the polyp. The dark area above is vaginal mucosa, the light area is fibrous vascular tissue. The broad channel below lined on both sides by columnar epithelium is the curious channel running up into the center of the tumor.

also the period of the exploration of the interior of the uterus with the uterine sound.

While the gynecological world was jubilant over these successful attacks on the century-old problem of intrauterine pedunculate tumors, it was but natural that the attempt should be made to go a step further in attacking some of the sessile hemorrhagic tumors by incising the capsule, and by dissecting away a part of the growth and leaving the rest to slough. This "sphacelation" process was indeed widely spoken of

then and there, so limited were the resources of our predecessors.

At last, in spite of bitter opposition, the fructifying principle of antiseptis and asepsis established itself in our hospitals, forced for the most part by the younger men on their unwilling elders. Gradually it came to be discovered that this new régime did not rest upon a chemical formula, but was a vivifying principle permeating the whole realm of surgery, and gradually there was developed that one great essential to its successful application—the antiseptic conscience. Simple as was the conception, so

applicable here; if the door opened a crack for Levret's toe, and wide enough to permit a few like Sims and Simpson to enter with difficulty, up to the eighties of the last century, it then at last did finally swing wide open to the entire surgical profession, so that the whole difficult dark subject at last was cleared up and operations could be undertaken without dread and with entire assurance of success. It was not some clever instrument that was wanted, as our forefathers imagined, but a new principle of which they had never dreamed; it was the new principle which ushered in the



FIG. 4.—A fibrous polyp at the fundus the cause of prolonged hemorrhages. FIG. 5, the same grasped and removed by the polyp forceps. FIG. 6, another mucous polyp removed in this way.

easily expressed in a few words, it yet completely bowled over almost all of our older men in their futile efforts to grasp and to apply it, so at length one by one they gracefully yielded the sceptre to the younger men, and for the first time in the history of the world in surgery it was the young man's day.

THE OPERATION FOR POLYPS TO-DAY.

There is an old French saying dating from Sganarelle, the quack physician in Molière, "Nous avons changé tout cela," which each new generation adopts for its motto, as it forges ahead. This is peculiarly

golden age of surgery which had at last arrived. To what extent it had arrived may be best illustrated by citing an operation which I saw August Martin do in his clinic in Berlin in the late eighties. The patient had a large submucous pedunculate fibroid tumor about as big as one's fist. Martin opened the abdomen and split the uterus wide open, and so removed the tumor; he then sewed up the incision.

To-day the first step is to make a diagnosis, which is important, as in a certain group of these cases it is still not infrequently missed. A careful inspection of the genital tract will reveal the cause of the

hemorrhages in most cases. A mere bimanual examination will not reveal everything, for some of the small soft cervical polyps cannot be felt except by the best trained touch, so one must look as well as feel, and the looking will often be rewarded by the discovery of one or two small raspberry-like mucous polyps hanging out of the cervix and crying for removal. By bimanual palpation of the uterus by rectum and abdomen one often recognizes its increased size and suspects the presence of a tumor within when it cannot be seen. Even

condemned to have their ovaries or their uterus removed on account of hemorrhage who have been perfectly relieved by a relatively simple and safe vaginal exploration and the subsequent operation.

METHODS OF OPERATING.

Little sessile cervical tumors may as a rule be safely twisted off at the cervix, or at the utmost the galvanocautery may be useful in cutting off the base and checking hemorrhage. A persistent hemorrhage can be controlled by pressure. Any tumor which presents a long accessible pedicle can be tied off near the tumor and the growth amputated. The fact that the antiseptic principle is now so universally accepted is sufficient reason for my not dwelling upon this part of the technique, which I assume to be the pole star of every one who calls himself a surgeon. It is well, however, in any intrauterine manipulations to wear rubber gloves and to clean up the field carefully. If the tumor is inaccessible inside the uterus it can be treated in one of several ways; smaller growths are discovered first when grasped by the polyp forceps; if such a tumor is not larger than a couple of centimeters in diameter it is safe in my experience to turn the forceps slowly until the pedicle gives way and the tumor is freed and can be removed. I have never seen any troublesome hemorrhage follow this bold plan of treatment. A mucous polyp grasped in this way often offers no resistance, and the operator may only know that he has found a polyp when he brings it away in the bite of the instrument. If my memory serves me aright, it was Dr. C. P. Noble who first suggested to me the routine use of the polyp forceps as an adjunct to the dilatation and curettage of the uterus. It is a most valuable expedient and ought never to be neglected in hemorrhagic cases. In a patient who had been condemned to have her ovaries removed some fifteen years ago, finding nothing below to explain the excessive loss of blood and knowing there was no malignancy from the curettages, I opened the abdomen, brought

FIG. 7.—A fibrous polyp hanging out of the cervix into the vagina.

though there is an obvious large fibroid uterus it must be remembered that the bleeding may sometimes come from a single submucous pedunculate tumor which can easily be removed from below. Where the cause of the hemorrhage is not visible, a more thorough exploration should always be made under gas anesthesia. When the cervix is dilated and the body examined with curette and polyp forceps, using the latter to grasp any body projecting into the lumen of the uterus, a fibroid may now and then be felt by the uterine sound, but I have not found such great help from this instrument as from the polyp forceps figured. I have not infrequently seen women

up and delivered the uterine body, and then cut into its cavity ("hysterotomy"), an operation which I practiced many times in the nineties, but for which I now rarely find an occasion; this revealed a fibroid polyp at the fundus about an inch in diameter, which was removed with entire relief of all symptoms. I must add here that repeated experiences with the use of the polyp forceps for these many years make me feel sure that I would now at once detect and catch such a tumor as this was in my vaginal examination, and so terminate the matter much more simply. When the tumor is the size of an egg or larger and the cervix is not dilated, and so the growth is not readily accessible, the best plan then is, under a complete anesthesia,

of a small egg, with a rather delicate pedicle, and was neatly amputated. Right at the site of the amputation was a funnel-shaped inversion of the peritoneum into the pedicle, and that this was not brought about by traction during the removal was evident from the fact that a few delicate strands of fibrin united the opposing peritoneal surfaces inside the funnel. I did not learn the fate of the patient.

In order to avoid such an accident as this or the commoner one of a big tumor with the fundus inverted into it, the only remaining obstacle to our perfect assurance in undertaking these operations, I have long resorted to the following expedient with entire satisfaction, namely, the bisection of all such tumors by grasping them at the

FIG. 8.—The best method of treating the same (Fig. 7) by bisection and then enucleation of each half separately.

to detach the cervix from the vagina anteriorly, catching it on both sides with a stout forceps, to incise the cervix up in the middle line, all the way into the uterine cavity, when the tumor can be grasped and removed and the cervix closed with sutures. A preliminary dilatation of the cervix will assist the subsequent drainage from the uterus. It is best in order to avoid accidents to treat all these cases seriously and to keep them in bed awhile, and then under observation for a time.

I spoke above of the risk of opening the peritoneum where there was a partial inversion of the uterus into the base of the tumor. I well remember seeing such a case in the museum of Professor Werth of Kiel, which dated from the time of his predecessor Litzmann. The tumor was the size

exposed periphery with a museau forceps on the right and one on the left of the midline, and then cutting boldly down right through the middle of the tumor (Figs. 7 and 8) until the fibrous nodule is cut completely in two, but no more. The pedicle is then transfixed and tied. If there is any inversion it is always above this point. Such a plan greatly simplifies the operation as well as makes it safer.

I make no apology therefore for bringing up at this time, in this informal, reminiscent way, this old subject, for we are only too apt in these days, with our attention fixed on big surgery, to take it for granted that minor operations are all simple and need only be dealt with on general principles; in this way occasionally much harm is done.

The Vitamines and Their Relationship to Health and Disease¹

BY A. D. EMMETT, PH.D., NUTRITIONAL CHEMIST

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What are vitamins? This question can be answered only in an indirect manner for no one has ever been able, up to the present time, to isolate them in a perfectly pure state. It is known that they are inanimate organic bodies which are closely allied in some respects to the amino acids, in others to the enzymes, and still in other ways to the lipoids. It is also known, from biological experimentation, that this group of substances, vitamins, is absolutely indispensable to certain of the normal life processes.

But if the vitamins have not been separated so that we can examine them and tell exactly what they are, how can we be expected to consider them seriously? As to this question the reader is referred to similar inquiries that were made when the studies on enzymes and proteins began, and to the meager knowledge we now possess as to the chemical nature and structure of the antigens and antibodies.

No physician, pathologist, or bacteriologist, for example, doubts for a minute that a greater or less degree of immunity can be brought about with the proper antitoxin if it is given at the right stages and in proper dosage. Yet we know almost nothing positive as to the exact chemical or physical changes that are brought about by this method of procedure. It would have been the height of folly, if after the discovery of diphtheria antitoxin some twenty-five years ago, we had decided to delay its therapeutic use until some one had separated the active principle in pure chemical form. If such had been the case, we would still be looking forward with anticipation, in spite of the immense amount of work that has been done toward concentrating and purifying this antitoxin.

Science works from the unknown to the known and gradually builds up a structure to support its findings. Time, however, does not permit man to idly sit by and wait until such work is completed. It requires us, in the interest of humanity, to grasp our opportunities and apply them as best we can, and then modify or qualify these findings as the later unfolding of conditions suggests.

In this light let us consider the subject of vitamins with an open mind and reserve a decision as to their real value until we reach the end of this series of articles. For on the one hand there are those who are inclined to be skeptical regarding these vitamins, while on the other hand there are some who have gone to the other extreme and are perhaps too enthusiastic in their hopes and expectations. It behooves us, therefore, to make a survey of this field—an inventory as it were—and to determine with fairness a position in the matter with respect to the so-called deficiency diseases and the relation that the vitamins play therein.

ESSENTIAL TO NUTRITION.

Basically we are dealing in the case of vitamins with the problem of nutrition—the metabolism of the cell. If we can stimulate the building up of the weakened or worn-out cells, then we have at hand, of course, a powerful weapon which will aid in preventing and overcoming disease. In many pathological conditions the treatment for stimulating normal cellular metabolism depends primarily upon specific medication and secondarily upon nutrition. That is to say, these two ideas are constantly interdependent; sometimes one is the predominant factor, then again the other steps into the foreground.

At the present time most physicians think

¹From the Medical Research Department, Parke, Davis & Company, Detroit.

of the nutritional phase of therapeutics by considering the dietary constituents that should be balanced, as the proteins, fats, carbohydrates, and mineral salts. If these four factors are properly adjusted, as to quality and quantity, they decide that the necessary amounts of energy and tissue building substances will be adequately supplied. From the newer aspects of nutrition, it appears that we must also reckon with an additional nutritive group, the vitamins, for without them, as we shall see later on, the fundamental metabolic processes will be so appreciably disturbed that the normal physiologic rhythm and sequence will not take place.

DISCOVERY OF VITAMINE.

It was some thirty-five to forty years ago that the etiology of beriberi—an endemic nerve disease which was very prevalent in the Orient—was found by the Japanese to be associated with a faulty diet. Eijkman was able to produce this disease experimentally in fowl by feeding them on milled rice. Later, Fraser and Stanton extracted a substance from the rice millings which prevented and cured the disease—polyneuritis—in pigeons. In 1911 Funk succeeded in concentrating this substance still further. In fact, he considered at that time that he had isolated the active principle, but later studies proved that he was wrong. From the chemical analysis that was made of this fraction, he considered that it had a basic group showing the characteristic properties of an amine. Since this material seemed so important to life he called it *vitamine* (*vita-amine*).

This *vitamine* related to and was specific for beriberi. Therefore, it was designated as the antiberiberi or antineuritic *vitamine*. We thus have the first definite illustration of a dietary deficiency disease with respect to the so-called vitamins.

Funk was of the opinion that there were probably other vitamins which would be found to be equally specific for other diseases. This same notion was possibly in the mind of Hopkins of England when he wrote in 1906:

"The animal body is adjusted to live either upon plant tissues or the tissues of other animals, and these contain countless substances other than proteins, carbohydrates, and fats. Physiological evolution, I believe, has made some of these well-nigh as essential as are the basal constituents of diet: lecithin, for instance, has been repeatedly shown to have a marked influence upon nutrition, and this just happens to be something already familiar, and a substance that happens to have been tried. The field is almost unexplored; only is it certain that there are many minor factors in all diets, of which the body takes account. In diseases such as rickets, and particularly in scurvy, we have had for long years knowledge of a dietetic factor; but though we know how to benefit these conditions, empirically, the scale errors in the diet are to this day quite obscure. They are, however, certainly of the kind which comprises these minimal qualitative factors that I am considering. Scurvy and rickets are conditions so severe that they force themselves upon our attention; but many other nutritive errors affect the health of individuals to a degree most important to themselves, and some of them depend upon unsuspected dietetic factors." (*Lancet*, 31, 1906.)

As an outgrowth of a series of researches, Hopkins reported in 1912 data which showed in the case of the albino rats that they required for normal growth not only the classical food nutrients, but in addition a minute amount of some constituent which was present in milk. This was the beginning of the exposition of the growth-promoting *vitamine*. In 1913, both McCollum, and Osborne and Mendel, working independently, published results which showed clearly that there was another factor that related to growth and body condition. This was found to be present and soluble in certain fats and oils, while the preceding *vitamine* was soluble in water.

Upon the basis of the solubility of these essential factors, McCollum suggested the classification as fat-soluble A and water-soluble B. Other workers have adopted this scheme in part but they prefer to use

in addition the term *vitamines*, or food hormones, or accessory food factors. In the case of the *antiberiberi* *vitamine*, it has been considered temporarily as being very similar if not identical with the water-soluble B.

Besides these two types of *vitamines*, there is a third one which Drummond, of the Lister Institute, has designated as water-soluble C. This *vitamine* appears to be specific for scurvy.

SOME COMMON SOURCES—REFINEMENT.

Having given a brief résumé of the discovery of *vitamines*, and a statement relative to their classification, it will be of interest to consider some of the foods and substances that contain them. The accompanying table gives a list of some of the

VITAMINES APPRECIABLY PRESENT IN—		VITAMINES PRACTICALLY ABSENT IN—	
<i>Fat-soluble Type.</i>			
Cod-liver oil	+ + + +	Yeast	—
Butter-fat	+ + + +	Vegetable oils	—
Cream	+ +	Seeds	+ ?
Egg fat	+ +	Lard	+ ?
Green leaves	+ +	Nuts	—
<i>Water-soluble B (Antineuritic) Types.</i>			
Yeast	+ + + +	Cod-liver oil	—
Germes of seeds	+ + + +	Vegetable oils	—
Rice millings	+ + + +	Lard	—
Natural grains	+ +	Butter-fat	—
Nuts	+ +	Milled products, as	—
Some vegetables	+ +	rice, flour, etc.	—
Orange juice	+ +	Cooked foods	+ ?
Skimmed milk	+		
<i>Water-soluble C Type.</i>			
Lime and lemon		Yeast	—
juice	+ + + +	Cod-liver oil	—
Orange juice	+ + + +	Nuts	—
Tomato	+ +	Grains and seeds	—
Some fresh vege-		Canned foods	+ ?
tables	+ +	Cured meats	—
Sprouted seeds	+ +	Cooked foods	+ ?
Fresh unpasteurized			
milk	+		

common sources of these *vitamines*. It also illustrates a very important point which every physician and dietician should bear in mind, namely, that a substance which is rich in one *vitamine* does not necessarily contain either of the others. Thus cod-liver oil and butter-fat possess the fat-soluble *vitamine* while they do not carry any of the other two types. Likewise, yeast should be rich in the water-soluble B food hor-

mone, but it never contains any of the fat-soluble A or water-soluble C types. On the other hand, orange juice has some of the water-soluble B and water-soluble C *vitamines* in it.

Again, one should bear in mind that a substance in its natural or fresh state may contain the *vitamines* yet it may lose them during the process of refining or preparation for consumption, either due to mechanical or chemical means. Thus, cod-liver oil in the crude state is very rich in the fat-soluble *vitamines*, but unless due precautions are taken during the process of purification the resulting oil may become extremely low in this *vitamine*.

If oxidation is allowed to go on it is very injurious to this *vitamine*, as well as the water-soluble C type. If alkalis are added to a food rich in the water-soluble B or C and heat is applied destruction will follow very rapidly. Contact with certain metals, as copper, will prove detrimental to the water-soluble C.

EFFECT OF COOKING.

A further point in question should be considered in passing, namely, the effect of cooking upon the *vitamine* content of foods. The essential facts that should always be borne in mind with respect to cooked foods are: First, in the case of stewing or boiling foods the water-soluble constituents pass into the liquor, and unless this is saved for soup, gravy, etc., the resulting cooked food will be very much depleted in these *vitamines*; second, the liquor must be faintly or distinctly acid—the presence of alkalis under these conditions is very injurious; third, the degree of heat and the length of time of cooking are very important factors to bear in mind; and fourth, the extent of oxidation that goes on during the boiling, roasting, baking, or frying of the food influences in direct proportion the destruction of both the fat-soluble and water-soluble C *vitamines*.

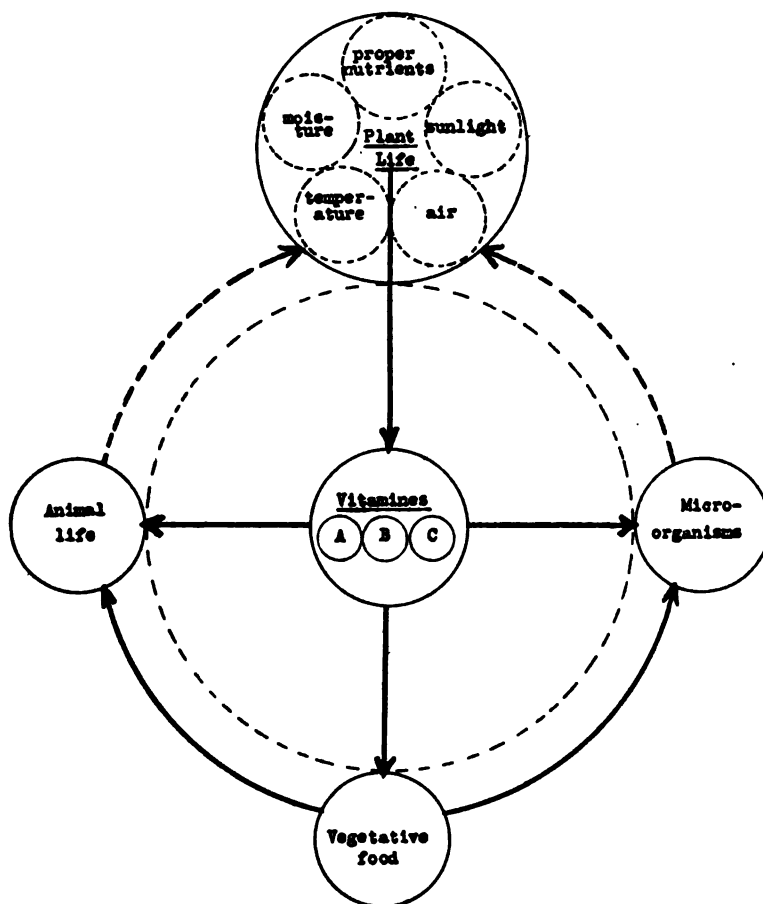
The following table shows the relative *vitamine* content of some uncooked and cooked foods:

*Comparative Antiscorbutic (Water-soluble C)
Value of Equivalent Weight of Substances.¹*

Fresh lemon or orange juice (raw).....	100
" cabbage leaves or juice (raw).....	100
" " " cooked 100° C. for 20 min. 30	
" " " " 70°-80° C. for 70 min. 10	
" Swede or turnip (raw).....	60
" tomatoes (raw)	60
" green beans (raw).....	30
Potato, cooked 100° C. for 30 min.....	7.5
Fresh carrot juice (raw).....	7.5
" beet-root juice (raw), less than.....	7.5
" beet juice (raw).....	7.5
Dry beans, peas, etc. (raw).....	7.5
Fresh cow's milk (raw).....1 to	1.5
Germinated beans, peas, etc. (raw).....	30

tent of the food is lowered. For example, carrots and apples are much lower in vitamins after storage than when fresh. Likewise, milk, if not pasteurized properly and then cooled quickly, will be almost devoid of the water-soluble C vitamin. "Bleached" and "burned" hay, which are sometimes fed farm animals, are both lower in the fat-soluble vitamin than when properly cured. In the silo the vitamins are destroyed to a greater or less extent.

Besides these changes which may take



VITAMINE CYCLE.

Vitamines are synthesized by plants and not by animals. Vitamines in foods are altered to a greater or less extent by sunlight, increased temperatures, oxidation, alkalinity, and age.

**EFFECT OF STORAGE—OTHER FUNDAMENTAL
FACTS.**

During the storage of vegetables and fruits the enzymic changes seem to so alter the chemical balance that the vitamin con-

place in a substance that has contained the vitamins, there are other fundamental facts that should be considered in evaluating a food or a product in respect to the relative amount of vitamins it carries.

Vitamines are synthesized by plants. They are not considered to be synthesized

¹Chick & Daly: *Brit. Med. Journal*, 1921.

by animals, although there is some doubt on this point with respect to the water-soluble C. The vitamins are stored in the animal tissues to a limited extent only. As a result the animal organism is dependent largely, if not entirely, upon the plant kingdom for its vitamins.

Further, it is known that the rate of growth of plant life and the kind of end-products produced are influenced to some extent by the amount of vitamins that are available in the medium or soil upon which the material is grown. For example, the growth of the yeast cell and the vitamin content of the cell are dependent upon the proper balancing of the nutrients in the media. Thus, we have some lots of yeasts that are rich in the vitamin B and others that contain little or none of it. It has also been shown that the fertility of the soil influences the vitamin content of the crops raised. The leaf of alfalfa hay, for instance, should be rich in the vitamin A, but it may be low in this fat-soluble vitamin due apparently to the condition of the soil. The quality of the milk and butter obtained from dairy cows fed upon this hay will be affected in a corresponding manner. The same thing may be said with respect to the water-soluble C, for this vitamin is the most unstable and labile of the three types.

These facts are illustrated in the accompanying chart, where the vitamin cycle is represented graphically. Here beginning with plant life, which is dependent for its ultimate success upon the proper nutrients, moisture, sunlight, temperature, and air, the vitamins are supplied to both animal life and the microorganism. The ultimate out-

growth of plant life is fruition in the form of vegetables or fruit. If these are in turn consumed by animal life and the microorganisms, the vitamins are again supplied to them, *provided* the vegetative life has not been subjected to conditions which have altered or destroyed the vitamins.

COMPLEX PROBLEM.

It is thus seen that we are dealing, in the case of the vitamins, with a very complex problem, one that calls for careful and sane consideration. We can see that we are not justified in drawing any broad conclusions as to what foods or substances contain an appreciable amount of the vitamins A, B, or C, without knowing the previous history of the material. Even then, we should be cautious in making our predictions as to the relative amount of vitamin that may be in the foods after they are prepared for consumption. Furthermore, one should consider that even though a substance may contain one or more of these so-called vitamins to a comparatively high degree, the fact still remains that this particular substance may be of such a nature as to cause a disturbance in the digestive tract and render the assimilation and beneficial effect of the vitamins impossible.

In other words, it would appear that the most logical point of view, at the present stage of our knowledge of this subject, is to take a conservative and rational position in the matter.

[In the next two articles the author will take up the question of how we can tell when vitamins are present, and the effects produced by their absence.]

(To be continued.)



The Action of the Different Elements of Diet in Infant Feeding—Experiences with the Czerny-Kleinschmidt Butter-flour Food¹

BY J. P. CROZER GRIFFITH, M.D.

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My purpose is to consider the old and much discussed, yet ever new and ever puzzling problem of infant feeding in some of its aspects. The subject in its entirety is too vast for more than a brief review of some salient features. I desire, too, especially to report the results of some interesting trials of the butter-flour food as recommended by Czerny and Kleinschmidt.

One advantage in having practiced medicine for a good many years is that one can review from actual personal experience some of the changes of views and advancements in knowledge of any subject in which one has been particularly interested during such a period. I wish, therefore, first to review with you some of the opinions which have obtained during this time with regard to the action of the elements of the food for the infant. About the time I commenced to practice medicine, there existed a growing belief in the injuriousness of too much casein in the infant's diet. This was based, to some extent at least, upon the studies of Biedert, who had shown that the normal amount of protein in human milk was but 1 or 1.5 per cent, and on the knowledge that in cow's milk the percentage of casein much exceeds that of the whey-proteins, lactalbumin and lactoglobulin, while this is not true of human milk. Consequently the view was emphasized, especially by Rotch, that the protein in the infant's food should not exceed the proportion existing in cow's milk, or should even fall below it, on account of the excess of casein present; and it was further urged that by the system of "differential protein feeding" the amount of whey-protein might with advantage be relatively increased until it equaled or exceeded that of the casein. It

was believed, further, that the fat should approximately equal in amount that present in human milk, and the sugar as well.

Good results were obtained, as they will often be by any method of feeding within the bounds of reason. Yet as the years passed it began to be impressed on a number of pediatricists, apparently nearly simultaneously, that for some reason the fat of the infant's artificial food was *not* tolerated as in theory we had expected it ought to be. Sometimes it seemed that the fatter the food the less the infant appeared to gain, even without there being any very positive evidences of fat-indigestion. This started a swing in the other direction, and we devoted ourselves to the employment of mixtures in which the percentage of fat was low. There was very much of reason in this last practice, which is still the prevailing one. The cow's milk fat is *not* digested as well as is that of human milk. However, with these newer views, in which the milk-mixture was low in the percentage of fat and only equaled in its percentage of protein that of human milk, it was evident that *something* must be added to make up the deficiency in calories, and for this purpose the amount of carbohydrate was increased. Since, however, it had been maintained that the normal infant did not well tolerate more than 7 per cent of lactose, and as more than 7 per cent of carbohydrate was often required, it became the practice to increase the carbohydrate percentage by the employment of other sugars, often with the addition of starch in some form; and the belief held sway, and still does in many quarters, that it was a matter of indifference whether the desired calories were obtained from the fat or from the carbohydrate. Just why starch did good one did not entirely know, but it was a clinical experience, based, presum-

¹Address given before the Northampton County Medical Society, April 15, 1921.

ably, on the early custom of the laity to feed infants with "pap."

Next came the publication of the views of Finkelstein, and these swept like wild-fire over Germany and to a large extent elsewhere. These views in part consisted of the claim that casein can be safely ingested by the infant in practically unlimited amount, and the fat, too, in good measure, if only the whey-protein and the salts were reduced. At first it was believed that the sugar also must be diminished in amount, but experience soon convinced pediatricists that this could not be done for any length of time, and the infant be expected to thrive. That Finkelstein's protein-milk, or "Eiweiss" milk, did good in very many cases was beyond question; but a grave doubt arose in the minds of many as to whether the theory for its favorable action was correct. In fact it has been maintained that the good results do not depend solely, if at all, on any one of the conditions believed by Finkelstein to be the cause.

Last of all there has been in recent years an increasing belief, first, that protein was not the harmless agent which many physicians had claimed; and second, that it was far from a matter of indifference whether fat on the one hand, or carbohydrate on the other, was used in the food. It was noticed that babies long fed on protein-milk eventually developed a certain degree of bluish pallor, that soap-stools began to be excreted, and that cessation of gain in weight occurred; and experience showed that these symptoms would sometimes disappear if malt extract or starch, or both, were added to the diet. It was found, too, that infants fed on a mixture fairly rich in fat acquired an appearance of health which was absent in those in whom the carbohydrate had largely replaced this. All this was independent of the presence in the fat of the milk of certain vitamins now supposed to be necessary to the thriving of the infant. Doubtless these exist, and constitute another reason why sufficient fat in the food is absolutely necessary to the best condition of health. I shall, however, not discuss this side of the question. It is very interesting in this con-

nection to note that in the earlier "Rotch period," if one may call it so, the presence of a considerable amount of fat was considered necessary for the prevention of the development of rickets; and that now the views of Mellanby of England, adopted by many, uphold this same relationship of the diet to this disease. Neither early in my professional experience nor now do I feel as yet convinced that the presence or absence of fat is the deciding etiological element in the production of rickets, and this is the opinion of many others.

Here I must discuss for a moment a certain retrograde movement which developed a few years ago, which, in my opinion, has done and is doing much harm. Based probably on views expressed especially by Heubner, but not with his scientific purpose, the effort was made in this country to "simplify" infant feeding by the employment of mere dilutions of milk with water, with the addition of sugar. The only claim advanced for the usefulness of this procedure was that it made infant feeding simpler for the physician. Now while simplification is desirable, accomplishing this at the expense of the infant is wrong; and while undoubtedly many infants will thrive, and do thrive, when fed in this way, yet the method itself is unscientific, and for many infants entirely impracticable. The range of variation in the food which this method offers is too limited, and it never permits of the giving of a properly large amount of fat with a properly small amount of protein, such as the most modern pediatric practice believes should be our aim. You will readily observe the contrast between, on the one hand, this "easy method" which teaches nothing as to the action of the different food elements, and leaves the physician helpless when difficulties arise; and, on the other hand, the constant effort on the part of scientific pediatricists everywhere to *understand* the real needs of the infant in the matter of its diet, to appreciate the action which each element of the food may be expected to exert and their mutual influence one upon another, and with this knowledge to devise a food which offers the

best hope of producing in the individual infant the best result. Ease in the method of accomplishing this should not be the question.

There is no easy method of infant feeding; there cannot be. We are giving the artificially fed infant something which it was never intended by nature that it should have; although we may obtain good results even sometimes with slipshod methods, in other cases we shall fail; and unless we have used every possible source of knowledge in the selection of our food, we are responsible for the bad and often fatal results which ensue. The man who is not willing to take trouble without end to get the very best result has no business to undertake infant feeding. The subject of infant feeding is never easy, and this is not my own opinion alone. In a journal article by Stolte, one of the well-known scientific continental pediatricists, the first sentence, translated, is as follows: "It is an extraordinarily difficult undertaking to raise a new-born human being with artificial food. Even though here and there children can be brought to a condition of splendid thriving with the most different methods, yet the results are far from being so sure of achievement that one can speak of a solution of the problem." Still later Czerny and Kleinschmidt, the names of both familiar to every pediatricist, say: "It is not unknown to every physician who is occupied either in private practice or in institutional work with the nourishment of infants, that the problem is accompanied by great difficulty in many cases, and especially is without that degree of certainty for which all of us would wish."

We may then with advantage consider briefly what are the needs of the infant in respect to the different elements of the food, and how well or ill each of these may be utilized. *Protein* is, of course, absolutely necessary, as it is the only nitrogenous substance in the diet. It is about the protein which I especially wish to speak in this connection, since the prevailing opinions about the manner of its employment and the tolerance for it are, I think, erroneous. Although it is necessary, it is

not needed in large amount—only about 7 per cent of the total calories of the diet representing the utmost need of the infant. Contrast this need with the amount supplied in protein-milk and similar foods—i.e., about 30 per cent! Again, there is another interesting feature regarding the protein which has been pointed out by Hoobler and others, viz., that you cannot replace the carbohydrate and the fat of the food by increasing the amount of protein, even from a mere calorimetric point of view. An increase of protein increases the protein metabolism, but that of the other elements goes on just the same, and if you do not supply them they will be absorbed from the stored-up glycogen and fat in the economy. But the employer of "simple dilutions," or he who thinks only of "replacement," apparently knows nothing about or ignores this fact. One other matter I must refer to, viz., the fact that the percentage of protein in human milk does not increase as the infant grows older, but becomes, if anything, rather less—an indication that all the printed tables of rules for infant feeding in which the strength of the protein increases with the age of the child are theoretically wrong. There are reasons, it is true, why the percentage of protein may well be increased in the latter half of the first year, but they are not because the increased amount of protein as such is needed, and certainly no rule can be formulated regarding it.

Finally, because the subject of the protein is so important, and because of the prevalence of the views of Finkelstein regarding this, I want to refer to just a few statements of recent writers upon this subject. Tanaka concluded from a careful review of the subject, combined with his own experiences, that although an increase of protein causes an increase of absorption of it, this was not retained, and those infants on a high protein diet finally cease to grow. Hoobler found that a decided excess of protein could produce a condition of apathy and even finally of semi-stupor. Benjamin observed a continued failure to gain weight when a high protein diet was

administered too long, and Glanzmann reports injury from protein when in over-amount, consisting of unhealthy appearance, loss of strength, meteorism, and other unfavorable symptoms. He regards protein-milk as unsuitable for a permanent diet. Bessau in a long article upon the pathology of injuries from milk, states that there is no more question of the production of injury by protein than there is by fat. The blue-gray appearance of infants fed long on protein-milk is a symptom of a high protein diet. Similar views are expressed by others, but there is no need for further quotation.

Nothing of what has just been said is intended to oppose a high protein diet as a therapeutic measure for a specific purpose and for a limited period, but is an expression against its continued employment when the emergency has passed.

Next we may briefly consider the *fat*. Normally this is very well absorbed from the intestine, more than 90 per cent being thus utilized. Frequently, however, especially in bottle-fed babies whose digestion is not normal, a large amount of fat is excreted either in the form of soft white curds, or in that of salve-like or hard soaps. In other cases fat is an active cause of sour, curdy vomiting. There is little doubt that more artificially fed infants are made ill by an excess of fat than by any other element of the food. With a fatty diarrhea there is a loss of potassium and sodium from the system, and with soap-stools calcium and magnesium may be excreted in excess, and in either event the child suffers and increase of weight ceases. When, then, this indigestion of fat develops, it becomes necessary either to replace the fat by carbohydrate to a large extent, or to render it in some way more easy of assimilation. The first plan is by far the simplest, and often works well for a time, but, as I have already said, the replacement is advisable, as a rule, only for a time. A sufficient amount of fat must be present to insure a proper absorption of calcium, and Orgler, among others, has pointed out that infants fed too long on carbohydrate substitutes suffer a loss of

water from the system, and a diminution in the general well-being. The high percentage of fat present in breast-milk is certainly not without significance as to the needs of the infant. Therefore, whenever we can, it is best to retain the fat as far as possible, and to attempt to make it more digestible in some manner. This can often be accomplished by the mere addition of a high carbohydrate percentage, especially if it consists in part of starch. It is not so much the excess of fat as the lack of proper proportion between the elements of the food which is detrimental. Both malt-soup and the new butter-flour mixture are useful in this connection. These will be referred to later. The cause of the disagreement of the fat in artificially fed infants probably depends largely upon the difference in composition between the fat of the milk of the woman and of the cow respectively. The latter contains a very much larger percentage of the volatile fatty acids than does the former, and it is on this that the sour, rancid vomiting depends in most instances. Let me remove at once any misapprehension as to my own views in this connection. I have been for years, and still am, a firm believer in the giving of diets very low in the fat-percentage to infants with evidences of fat-indigestion. I find more trouble with fat than with any other element. But such diets are to be employed as therapeutic measures, and a return to one containing a larger amount of fat made as soon as it can be done safely.

Next in order comes the *carbohydrate*. The sugar of the food is entirely absorbed, and it is astonishing, also, how early in life any starch which may have been added to the diet is nearly or quite utilized. As to the sugar, although lactose is the natural variety in the infant's food, and is more slowly absorbed and therefore more liable to maintain a proper condition of the intestinal flora, yet there are numerous cases where some other form of sugar is more suitable. In some instances saccharose may be serviceable, and in others, and more frequently, a maltose-dextrin preparation. Maltose alone is liable to be laxative in

action, although this is not always the case. The action of starch in the digestive processes would seem to be manifold. It may act in part mechanically like a colloid, as has been claimed, and disintegrate the masses of fat and of protein more thoroughly. It is probable, too, that it aids in the maintenance of the proper flora in the lower intestinal tract, on account of the longer time required for its conversion and absorption. If lactose or maltose-dextrin preparations are used alone, they may be absorbed too rapidly, and the proteolytic germs consequently prevail in the lower intestinal tract of the artificially fed baby, instead of the lactic acid group, as is the case in the breast-fed. Starch, according to Bessau, especially if combined with malt extract, will change this condition to that normal for the infant. Then in some obstinate cases of vomiting, as, for instance, in pyloric stenosis, there is no question but that a thick starchy gruel is less easily vomited than is a thinner food.

Yet carbohydrates in excess may produce a disordered condition. Not infrequently an acid diarrhea develops which causes excoriation of the buttocks; and vomiting, too, is not uncommonly produced by an excess of sugar. Further, a diet exclusively starchy may produce edema, perhaps with a hypertonic condition. One may then readily be deceived by an apparent gain in weight in the infant which in reality depends upon water in the tissues.

As regards the *salts* of the food, our knowledge is very limited. There is an abundance of these substances in the artificial mixture. The question is as to their absorption and retention. Calcium is not well absorbed if the fat is insufficient, and a negative calcium balance develops if the protein is in excess.

Finally, with the discussion of theories which we have just had in mind, we may consider a few of the methods and food formulæ which may serve us well in time of need. First, as to infants with normal or nearly normal digestion. That human milk contains 4 per cent of fat, 7 per cent of sugar, and 1 to 1.5 per cent of protein is, as

I said, suggestive. There must be a reason for it, just as there must be a reason why the calf needs less sugar and from 3.5 to 4 per cent of protein. It would seem indicated, then, that, whenever we can, we should supply the young infant with a food containing sufficient fat and not more than 1.5 per cent protein. We can seldom give the full 4 per cent of fat in an ordinary milk mixture, because, probably, of the volatile fatty acids of the cow's milk fat; but we may often make the fat more digestible by the addition of a strong barley or other cereal decoction.

I have been especially interested recently in trying a food which was proposed by Czerny and Kleinschmidt, to be used especially in young or premature, underweight infants without any very active digestive symptoms—just such cases as ought to have human milk if it could be obtained. The formula employed by them, in what they call their "butter-flour" mixture, was based upon an attempt to approximate the composition of human milk more closely. The fat-percentage was kept high, but the volatile fatty acids were driven off by heat. The protein was kept down to the percentage of human milk. The carbohydrate was high, and consisted partly of starch, which was partially dextrinized by the heat employed in making the mixture. It was used because it clearly added to the assimilability of the high percentage of fat. The proportions recommended by them consist of 7 grammes of butter, 7 grammes of flour, 5 grammes of sugar, and 100 Cc. of water, to be mixed with varying amounts of milk, according to the age and weight of the patient. These figures may conveniently be rounded off to, say, 20 grammes of butter, 20 grammes of flour, and 15 grammes of sugar in 300 Cc. of water, but the relationship of the butter to the flour must remain unchanged. For new-born, underweight infants the amount of butter and of flour may well be reduced to 5 grammes, and that of sugar to 4 grammes, in the 100 Cc. of water. In the actual process of preparation, 20 grammes of butter are placed in a pan and heated over a gentle fire

until foaming takes place, and until any odor of volatile fatty acids has disappeared. This requires from three to five minutes. With this are now mixed 20 grammes of fine wheat flour, and the mass again boiled over a gentle fire with constant stirring until it becomes thin and of a brownish color (four or five minutes). Finally 300 grammes of warm water and 15 grammes of cane-sugar are added, and the combination again boiled, rubbed through a fine sieve to remove lumps, and then mixed with the desired amount of previously boiled, cooled milk, and the whole kept cold in individual bottles until ready to be used. The addition of salt is not necessary, as this is contained in the butter. For children under 3000 grammes in weight one-third milk is mixed with two-thirds of the butter-flour mixture. For those of 3000 grammes or over two-fifths of milk and three-fifths of the butter-flour stock are employed. Not more than 200 grammes per kilogramme of body-weight—i.e., about 3 fluidounces per pound—should be given daily, and smaller amounts than this are usually required, owing to the high caloric value of the food. The authors lay particular emphasis upon the importance of giving this restricted amount. The results were truly remarkable. Not only did the weight go steadily up as in breast-fed infants, without the irregularities usually seen in the bottle-fed; but the general appearance, color, distribution of fat, and the like, all resembled the conditions seen in the breast-fed child. There was no abdominal distention; infants who had been vomiting did not experience an increase of this, but often a diminution, and the stools were yellow and of good character.

Although not expecting and not obtaining good results in every instance, Czerny and Kleinschmidt yet found on the whole better results than from any other method of feeding with which they were acquainted. The proper selection of the cases was very important. They did not recommend the food for infants with severe acute digestive disturbances, with or without fever, but rather for the weakly and often premature infants

much below weight, who had not been made to thrive on other foods which had been given. They found it frequently of benefit in very young, premature infants when alternated with the administration of breast milk, in cases in which there was not sufficient of the latter to permit of breast feeding alone. One great advantage of this method of feeding was that it could be continued with benefit for months. There was no necessity for an early abandoning of it as with protein milk or some other foods.

The need of aid in our methods of feeding in difficult cases in infancy is shown by the fact that numerous other investigators have followed in the footsteps of Czerny and Kleinschmidt, and in nearly all cases with remarkably good results. In fact there has developed an enthusiasm for the new food strongly reminiscent of that which was evidenced when the Finkelstein protein milk was first brought to the attention of the medical profession. One needs only to note the reports from such well-known names as Moro, Stolte, Bessau, Langstein, Thiemich, Berend, and many others. I need not occupy your time by giving you abstracts of what they say. The opinion is almost unanimously favorable. Dr. Mitchell and myself have been using this food in the Children's Hospital in the last few months with great success. Our cases there furnish a very searching test of the value of the food; for we have not only premature, under-weight children to deal with, but those who have suffered from previous prolonged digestive disturbances, a class of cases for which the food was not originally devised, and yet our results were good. In one case the infant was five months old on admission, and had been in the hospital for over two months, fed with almost every conceivable method without any benefit whatever. The child was a wretched subject weighing only seven pounds when the butter-flour food was commenced. Improvement began promptly and continued without intermission. Another baby presented such a miserable aspect that the mother dreaded visiting it, and in fact did so only at long intervals. After the admin-

istration of the butter-flour food for a time, its appearance had changed so much for the better that the mother could hardly believe it was her own baby. Of course, not all our results were as good as these, but on the whole they were surprising. Of 30 infants only 9 did not do well, and in nearly all of these improvement on any plan of feeding whatever could not have been expected, since most of them were incurably ill with disorders other than digestive.

In order to render the preparation of the food more simple in the household, where scales and gramme-weights and the like are rarely accessible, we determined the equivalents in ordinary household measures, and the following modified description of the preparation may be given: A small amount of butter is placed in a glass, and this stood in warm water until it melts. The butter-flour mixture is then constructed by using 2 tablespoonfuls of melted butter, $2\frac{1}{2}$ level tablespoonfuls of flour, $1\frac{1}{2}$ level tablespoonfuls of cane-sugar, and 10 fluidounces of water, instead of the 20 grammes each of butter and flour, the 15 grammes of sugar, and the 300 grammes of water. These, of course, are treated exactly according to the method already described.

In the short time remaining to me I wish to refer to a few other methods of feeding, long in use in certain disordered digestive conditions, since the butter-flour food is intended, as stated, especially for infants without these. First I will refer again to the employment of gruel in some obstinate vomiting cases. This is useful not only in pyloric stenosis, but in obstinate habitual vomiting in young infants, for not only is the digestive power perhaps diminished, but the nervous control of the stomach has become hypersensitive and the habit of vomiting has become established. I have had some splendid results in infants who have vomited every other kind of nourishment which we had tried. The gruel should be of 5- or 10-per-cent strength, made from rice-flour, wheat-flour, or farina, using at first 1 part of skimmed milk and 3 parts of water. Later, if successful, the skimmed milk can be increased in amount, and finally the

skimming can be omitted. We must remember that this and other preparations to be mentioned are only for temporary therapeutic use. We should return as soon as we can to the principles already emphasized regarding the desirability of giving the infant a sufficient amount of fat.

Next I would mention the dietetic treatment of cases with the persistence of soap-stools and cessation of gain in weight, as well as of those with large, white, curdy masses in a green stool. Here we may often accomplish excellent results with malt-soup. This, as you know, consists of a combination of a non-diastatic malt extract with wheat-flour, water, and milk. The method of preparation commonly advised is well known, and I need not enter into it here. Ordinarily we may well follow the formula proposed by Keller, which is furnished with the malt-soup extract as supplied by the different makers. The good results are usually attributed to the reduction of the fat to about 1.33 per cent; but we must not forget, as Benjamin has pointed out, that we also have a low protein percentage equaling about that of human milk. The carbohydrate percentage is high, about 11.5 per cent, and consists partly of starch, since the non-diastatic malt extract has had its power of converting the starch removed in the process of its preparation. Under this food the excess of fat will often disappear promptly from the stools and gain in weight will recommence. There are two disadvantages often accompanying the employment of this diet—the first that babies who are disposed to vomit will often not tolerate the high percentage of sugar; the second that the food is often distinctly laxative, and this appears to be especially true of the liquid malt-soup extracts on the market. These symptoms can be ignored if they are not very marked and if the gain in weight is satisfactory. If it is necessary to control them, the malt extract may be reduced a little in amount, or for the diarrhea an astringent medicine may also be given.

When the infant shows a very decided intolerance for fat, there is no diet in my experience as good as the popular butter-

milk mixture which has been used for many years by the laity of Germany and Holland. By buttermilk I mean really a *Buttermilk*, made at home, and from which the butter has been removed by churning in a small churn. It may be prepared as follows: To 1 quart of milk, previously pasteurized, is added the contents of a tube containing a reliable liquid culture of the Bulgarian bacillus. The milk is now allowed to stand from 18 to 24 hours at a temperature of 100° or somewhat less, until it exhibits a fine, flocculent, curdy appearance. If it stands too long it will grow far too sour, and will separate into a solid mass of curds and a whey-like liquid. After the proper degree of coagulation has taken place, the butter is removed by churning in a small glass churn. One level tablespoonful of wheat-flour is now rubbed into a paste with 6 or 8 ounces of the buttermilk, and 4½ level tablespoonfuls of granulated sugar added; this is then mixed with the remainder of the quart, and the whole boiled gently for 25 minutes with constant, vigorous stirring. Neglect of the stirring allows the mixture to become too lumpy. The buttermilk mixture prepared in this way contains approximately 1 per cent of fat, 11 per cent of carbohydrate, and 4 per cent of protein, but these figures vary somewhat. If it is desired to maintain the Bulgarian bacillus alive, the milk should first be pasteurized; the buttermilk then made from this; the flour then boiled with a small amount of the buttermilk, and this, with the sugar, be added to the remainder of the quart of un-boiled buttermilk. The final boiling is to be omitted. It is surprising how often this buttermilk food will quickly alter the condition of the bowel movements. I have had perhaps better results with this than with any other method of treating fat indigestion, either intestinal or gastric. Sometimes the high percentage of sugar causes vomiting. In that event the amount of it should be reduced.

Finally a word regarding the protein milk or "Eiweiss milk" of Finkelstein. The method of its preparation is decidedly com-

plicated, and need not be given here. It can be found in any text-book on the diseases of children. The food contains about 2½ per cent of fat, 1½ per cent of lactose, and 3 per cent of protein. Later the percentage of sugar should be raised by the addition of a maltose-dextrin preparation. The mixture has been found very useful, particularly in chronic diarrheal conditions. We must not forget what has already been pointed out as to the unfavorable effects if it is continued too long. Its employment should be regarded as a purely therapeutic measure.

Luetin.

WARD, in the *American Journal of Syphilis* for July, 1921, calls attention to the finding of 87 per cent positive luetin reactions in 42 syphilitics. In a second series of 200 unselected cases attending the public clinic there were 75 per cent corroborative returns.

As an indicator of the value of antisyphilitic treatment it has verified the Wassermann test in a high proportion of cases, but remained positive in 10 to 15 per cent.

These findings are suggestive that luetin as a measure of the allergic reaction in syphilis has a much higher value both negatively and positively than has been emphasized heretofore.

Criticism of both the luetin test and reaction has been due to a lack of study and experience rather than from skill in estimating values. Luetin itself is in need of standardization and could be easily improved.

The findings and the opinions recorded here are clearly in harmony with original reports and the more recent literature.

In view of these facts it is believed that the complement fixation and the luetin test should be made simultaneously in every suspected case of syphilis.

Alone each expresses but a limited truth; together a more rational conception is possible, and this is seriously suggestive in the supremely important question, "Is the case cured?"

Editorial

CHANGES IN CARDIAC FUNCTION PRODUCED BY DISEASE.

The remarkable advances which have been made in our conception of cardiac conditions by the employment of the polygraph and the electrocardiograph have modified and controlled our use of digitalis and near-related drugs to a very great degree, proving that massive doses of digitalis in some instances may save life and in other instances may hurry death. Most of the studies have been made upon normal hearts or hearts suffering from valvular or myocardial lesions of a subacute or chronic nature, but far too little has been done in the way of investigating cardiac conditions in the course of acute infectious diseases, which is the more remarkable because in pneumonia, typhoid fever, and other infections, as, for example, rheumatism, the condition of the patient is usually not such as to forbid an electrocardiographic study.

It is entirely possible, and indeed likely, that the toxemias of various infections may produce functional or organic changes, temporary or permanent, in the heart muscle which will strongly indicate a drug on the one hand and contraindicate it on the other. In our opinion the day is not far distant when we will learn that in many cases of the acute infections digitalis is absolutely essential, and in others is absolutely deleterious, although in both types evidences of cardiac incapacity may be manifested.

Greene and Gilbert have recently carried out a study dealing not so much with the effects of infection on the cardiac muscle as upon the influence of lack of oxygen or an excess of CO_2 , conditions which are often present in the acute infections, notably in pneumonia, and which may also be present in instances where there is ruptured

compensation with impaired cardiac and respiratory activity. They point out that the electrocardiogram of man is not materially altered by slowly induced oxygen deficiency until a certain stage or crisis is reached when fundamental intrinsic changes in the cardiac mechanism begin. There is a decrease or shortening of the time of the P-R interval and an acceleration in conduction time coincident with augmentation of the heart-rate from exercise, although this augmentation is not universally observed. There is a decrease in the total time of the R-T interval similar in type and reaction frequency to the change in conduction time, and a marked decrease in the amplitude of the T wave. Sometimes the T wave comes diphasic.

When the want of oxygen is extreme, there is great slowing of rate, a progressive descending displacement of the pace-maker, or center of rhythm production, toward and into the A-V node, and interference with normal conduction leading to dissociation. This latter statement is of interest in connection with the administration of digitalis, since digitalis in full dose tends in many cases to induce dissociation and, therefore, in the presence of asphyxia may do harm rather than good. Indeed, in some instances they found that there was complete suppression of conduction although no digitalis was administered.

Possibly in these facts we find an explanation of the advantage to the patient of administering caffeine in full doses, since this drug by stimulating the respiratory center tends to overcome the oxygen want and stimulates the heart, but does not tend to increase block; and again these researches may explain the value of atropine, which tends to diminish block and which heretofore has been supposed to act chiefly by its influence on the vagus or on the vasomotor system.

INTRAPERITONEAL INJECTION.

More than once within recent years we have called attention to the fact that many physicians, who make a specialty of diseases of children, have resorted to intraperitoneal injections of various fluids to combat collapse, in the so-called acidosis of cholera infantum and to overcome the effects caused by loss of blood in the new-born, and in any other state characterized by an inability to retain and absorb fluid taken through the mouth. It will be recalled that the method consists in introducing a hollow needle through the abdominal wall about an inch below the navel, using ordinary precautions as to careful asepsis. Various fluids have been employed, most commonly normal salt solution, and the experience of those who have described this method most seems to have been favorable. The general consensus of opinion has been that such injections are harmless, that they often do good in desperate cases, and that the absorption of fluid from the peritoneal cavity is remarkably rapid. Until recently, however, little has been done by way of experimentation or scientific research to determine the actual rapidity of absorption, and also to decide whether any changes were produced in the peritoneum which could in any way be considered harmful.

Manifestly the absorption of fluid from the peritoneal cavity must vary in its rapidity very greatly in different states and conditions. Where the tissues have been deprived of liquid by excessive purging and vomiting, it is conceivable that they will greedily take up an amount of fluid from the peritoneal cavity which will reestablish as nearly as possible their normal condition, provided, of course, that the condition of collapse is not so far advanced that the circulation is too sluggish to permit of normal absorption processes. In conditions of intoxication, on the other hand, no such tissue thirst is present, and the fluid will not be absorbed with great rapidity for obvious reasons; being taken up in all probability no more rapidly than the skin and kidneys are capable of eliminating it. In some conditions, too, it is probable that if the kid-

neys are functionally inactive or actually diseased, there will be some danger of artificially drowning the patient, as for example when hypodermoclysis is freely resorted to in certain cases of nephritis when the kidneys cannot eliminate fluid.

Recently Denzer and Anderson, in the Children's Service of the New York Nursery and Children's Hospital, have made a further contribution to this interesting subject. It is not necessary to prescribe the technique of their work. The point which is of interest for the general practitioner is that they use the method of abdominal tapping not only for the purpose of introducing fluid into the peritoneal cavity, but also for the purpose of withdrawing fluid from that cavity in order to obtain cultures and to thereby get a clear conception of the pathological processes involving the intestines and peritoneum.

When they came to study the rapidity of absorption and the effects upon the peritoneum of the injection they found that there was considerable variation, and it may be said that their results do not indicate that the fluid is taken up as rapidly as many other clinical observers have been led to believe. Thus, as a result of their work, they seem inclined to think that complete absorption of injected fluid does not take place in less than twelve hours and often not for forty-eight hours.

Another point of very considerable interest readily overlooked, and yet one which is universally recognized by physiologists, is the question as to the relative rapidity of absorption of tonic, hypertonic, and hypotonic solutions. This is a matter of great importance, since in most of the instances in which intraperitoneal injections are to be resorted to a fairly rapid absorption of the fluid is desired. The average clinician is too prone to overlook the fact that a hypertonic saline solution tends to cause fluid to be poured out in order that it may be isotonic with the surrounding tissue, and that contrariwise a hypotonic solution should be fairly rapidly absorbed from the peritoneal cavity into the blood-vessels following the law governing osmosis.

These investigators do not seem to have

gotten very definite results when using hypotonic solutions in children, but in animals they point out that a hypotonic solution is more rapidly absorbed than a normal or hypertonic one.

It is equally manifest that pure water should not be used, and we would suggest that solutions in the neighborhood of 0.5, 0.6, or as low as 0.3 per cent be employed rather than the normal strength of 0.9 per cent.

Many years ago we pointed out that the crude method of using common salt in the proportion of a teaspoonful to a pint of water, while it may be satisfactory for irrigation purposes, is too inaccurate for intravenous or intraperitoneal injection, if the salt is not accurately measured. Again, sodium chloride is the only ingredient, whereas blood serum contains other salines. As a rule so-called "concentrated sterile saline," already prepared for further dilution by sterile water, should be employed and reduced to the strength that we have named for intraperitoneal injection by using a slight excess of water over and above the strength commonly employed for intravenous injection.

Finally, a word may be said in regard to the effect of such injections upon the peritoneum. These investigators found that a temporary reaction was induced, or what they call a sterile inflammation, but this sterile inflammation did not seem to be followed by any evil effects, as indicated by any symptoms which could be observed clinically or by a study of the cells obtained from the abdominal cavity by paracentesis.

THE VALUE OF IRON IN SECONDARY ANEMIA.

We presume that there are few points in therapeutics which are more definitely settled in the mind of the laity and in the mind of physicians than that iron is a valuable remedy in secondary anemias, and in all probability many medical men believe that it is a useful adjunct to arsenic in the treatment of primary anemias. There have been many papers published within com-

paratively recent times which have seemed to put this clinical estimation of its value upon a scientific basis, as, for example, the researches of Hamburger, Gottlieb, Muller, Jacobi, Stockman, and others. It has been recognized by some that the large doses of iron frequently administered are unnecessary since the total quantity of iron in the human body is very small, and in the large doses which are commonly employed, nine or ten grains a day, an amount is soon ingested which is equal to the body content.

It has also been recognized that in chlorosis, which is now classified by most hematologists as a primary anemia, large doses of iron are essential for reasons which are not clear, although it has been thought that in many cases of chlorosis most of the iron ingested is changed into a sulphide of iron by the sulphuretted hydrogen in the bowel which is present in excess when there is constipation.

Our attention has been called to this matter again by an investigation recently reported in the *Archives of Internal Medicine* by Whipple and Robscheit, who produced a secondary anemia in dogs by bleeding, and then carried out a very exhaustive study as to the influence of various preparations of iron in the regeneration of the blood. The conclusions which they have reached are startling, and if true as to human beings must very considerably modify our opinion of the value of this standard remedy. Most of our readers will be somewhat taken aback when they learn that these investigators claim that their experiments give no support to the time-honored custom of administering iron and certain other drugs in conditions of simple anemia, and that the burden of the proof now rests with those who claim that any given drug is potent under such conditions. They do not deny that patients who are taking iron and arsenic improve, but apparently their point of view is that the improvement is chiefly due to dietetic conditions rather than to the drugs which are swallowed.

We have here a research which deserves attention because of the extreme care exercised by these investigators in regard to

the elimination of factors of error, and we also have here an illustration of how scientific ardor may lead investigators to ignore certain facts which do not seem to them to be based on scientific investigation, but which nevertheless seem assured as the result of clinical experience.

We have often pointed out that pharmacological investigations on animals are of the greatest possible value in that they increase our general knowledge and often correct error, but at the same time we have protested against the laboratory investigator lightly brushing away the experience of thousands of clinicians after making a few experiments upon animals, not that the results obtained are valueless or lacking in interest, but because the two sides of the evidence have not been adequately considered.

It has always seemed to us that where a research such as this seems to destroy preconceived ideas, it is well for the investigator to publish his results, and then not to deny the correctness of clinical opinion, but before deliberately stating that a drug is useless it would be well if he went further and tried to adjust the apparent discrepancy between the results that he has obtained and those obtained by his clinical confrères. To illustrate what we mean it will be recalled that every research which has been made upon the influence of calomel upon the flow of bile in human beings and in dogs, or other animals, has seemed to indicate that it is entirely devoid of power over the liver, and yet we presume that, here again, the medical profession has a deeply seated conviction that calomel is a hepatic stimulant. It may be true that it does not act in the way which it has been supposed to act. Under these circumstances it is up to the laboratory investigator to find out how the clinician gets the results which undoubtedly accrue rather than to make the *ex cathedra* statement that calomel is of no value in hepatic torpor. We mention these facts because they have a direct bearing upon the research which we are discussing.

Admitting the accuracy of the method

employed by the investigators that we have quoted, we nevertheless are not prepared to accept their accuracy as to secondary anemia in human beings because it seems scarcely credible that thousands of physicians could have administered iron for generations and have been utterly mistaken in their belief that it is valuable when properly employed.

What the clinician needs is not alone investigations which seem to disprove the value of things in which he has confidence, but investigations which go far enough to not only correct him, but to explain matters which are obscure, and, in addition, at least offer a substitute for the remedy which has been claimed to be without value.

If we had not thought this research accurate we would not have called attention to it. The point of doubt that is in our mind is whether the conditions represented in the animals used are identical with the conditions that exist in human beings, and we confess that until still more evidence is adduced we shall continue to believe with many of our colleagues that iron is a useful drug in secondary anemia.

CONJUGAL NEUROSYPHILIS.

There is an accumulating but not convincing evidence based on certain clinical data which strongly suggest the incidence of a neurotrophic strain of the *Spirochæta pallida*. Part of this evidence is based on the comparative frequency of neurosyphilis in both partners to a marriage and in their children. This phase of the question is considered by Moore and Keidel (*Journal of the American Medical Association*, July 2, 1921), who publish the results of their examination of the marital partners of fifty neurosyphilitic patients. Fifty-two partners (forty-two wives, two mistresses, and eight husbands) were examined by the physical and serologic methods, these including a careful anamnesis, physical and neurological examination and investigation of the Wassermann reaction of the blood and of the histobiology of the cerebrospinal fluid. In

most instances both the neurosyphilitic patient and his partner were examined personally.

The incidence of neurosyphilis in an unselected class of untreated or badly treated syphilitic patients is probably between 25 per cent (Mattauschek and Pilz, from clinical observations), and 35.7 per cent (Wile and Marshall, based on 1869 spinal punctures on patients in all stages of syphilis, including 349 neurosyphilitics). In a large number of syphilitics without definite neurologic involvement, subjected to an amount of treatment known to be insufficient to cure, it was found to be from 12 to 16 per cent. Of the forty partners of this study demonstrated to have syphilis, fifteen had had one or more courses of treatment before spinal puncture was performed; so that the expectation of neurosyphilis in this group of patients might fairly be put somewhere between 15 and 35.7 per cent. Actually, however, 52.5 per cent were neurosyphilitic. This may be considered as evidence in favor of a special strain of infecting organism with a predilection for invasion of nervous tissue. Complicating factors arise, however, when these patients are divided into the two groups of partners of parenchymatous neurosyphilitics (tabes and paresis) and those married to neurosyphilitics of the cerebrospinal (meningovascular) type. Of twenty-two syphilitic partners of the first group, fifteen, or 67.2 per cent, had neurosyphilis. This incidence seems far too high to be coincidental; but of eighteen partners of the second group, only six, or 33.3 per cent, were neurosyphilitic, which is not materially greater than the expected incidence of neurosyphilitics in any group. As already pointed out, furthermore, the duration of marriage and of syphilis in the syphilifer is about twice as long in the combined groups of parenchymatous neurosyphilis as in the group of cerebrospinal syphilis. An attempt to employ this fact to explain the discrepancy of neurosyphilis in the partners in the two groups conflicts with our present-day theories regarding the genesis of neurosyphilis. So far as we now

know, the central nervous system is invaded early in the course of the disease, probably at the time of the first period of generalization, and, except under unusual circumstances, not at any other time. It is therefore not permissible to argue that if the nervous system has not been invaded by the ninth year after marriage, invasion may yet take place before the sixteenth year, and thus bring the incidence of conjugal neurosyphilis in the group of meningovascular syphilitics equal to that of the parenchymatous group.

A further essential point in the argument of the supporters of the neurotropic strain theory lies in the comparative infrequency of symptoms of early syphilis in patients with neurosyphilis, and especially parenchymatous neurosyphilis. This infrequency is well illustrated in the present series in the syphilitic partners of tabetics and paretics; but two-thirds of the partners of cerebrospinal syphilitics had passed through the usual course of early syphilis.

If the scientific value of this material, so far as it permits a division of the organism of syphilis into distinct strains, is inconclusive, the practical value of the work is nevertheless obvious. The slogan introduced by Solomon, "The family of a paretic is the family of a syphilitic," receives ample support. It is as much the duty of every physician who deals with neurosyphilis to investigate the families of his patients as it is that of the physician who treats early syphilis. Furthermore, the seven spouses in this series with asymptomatic neurosyphilis demonstrate that such an investigation must be complete. Unless it includes anamnesis, physical and neurologic examination, and the usual laboratory tests of the blood and spinal fluid, it is inadequate.

Moore (*Archives of Dermatology and Syphilology*, Vol. 4, No. 1, 1921) observes that invasion of the central nervous system takes place in 35 per cent of all syphilitic patients at the time of the first generalization of the disease. The theory has gained some acceptance that neurosyphilis of whatever type practically always originates in

the first few months of the infection. He divides early syphilis into two groups: a group comprising from 20 to 35 per cent of all cases in which neurologic invasion takes place at the time of, or before the appearance of, secondary manifestations; and the remaining 65 to 80 per cent in which no such invasion can be demonstrated. Evidence is rapidly accumulating to permit a division of the first group into three subgroups on the basis of response to anti-syphilitic treatment, namely, a small proportion who spontaneously deal with the neurologic infection; a fairly large proportion, perhaps about one-half, who are rapidly brought to a serologic normal by routine treatment; and the remainder, whose asymptomatic neurosyphilis is eradicated only with the utmost difficulty, and who probably represent the class of future parenchymatous neurosyphilitics.

The importance of a clear conception of the time of origin of neurosyphilis is at once apparent when the relations of the disease process to treatment are considered. Does invasion of the central nervous system always take place within the first few months of the infection? If not, may it occur at any time, or only under special late circumstances? If one adheres to the theory that all neurologic infections are early, and may be detected during their asymptomatic stage by the simple procedure of spinal puncture, it would appear feasible to eradicate neurosyphilis almost completely by means of adequate, intelligent treatment. Furthermore, if a negative spinal fluid examination rules out the possibility of the later development of neurosyphilis, it is unnecessary to repeat lumbar puncture, and the patient may be dismissed with the positive assurance that he need not fear tabes or paresis.

If, on the other hand, it can be demonstrated that a patient in whom early neurologic signs were absent and whose cerebrospinal fluid examination was negative later did develop neurosyphilis, and if it can be further shown that this contingency may arise under certain definite circumstances, it may be possible to predict the necessity for repetition of lumbar puncture. The de-

velopment of late neurosyphilis might be determined in two ways: by the appearance of clinical signs of neurologic involvement, and by the demonstration of positive cytobiologic changes later in the course of the disease.

Moore summarizes the result of his study as follows:

In fifty-four cases of syphilis in all stages of the disease, but without demonstrable neurologic involvement, an early negative spinal puncture was repeated, with positive results in two.

In one of the positive cases, invasion of the central nervous system had apparently taken place by direct extension from a gummatous periostitis of the inner cranial table; in the other, it probably occurred during a second period of generalization of the disease.

In the majority of cases of neurosyphilis, invasion of the central nervous system takes place during the first few months of the infection; but in some cases it may occur at any time during the course of syphilis by one of the two mechanisms outlined.

The appearance of recurrent secondary syphilis or the recurrence of a positive blood Wassermann reaction after a lapse in treatment is the probable outward manifestation of a fresh generalization of the disease, and should be made the occasion for reëxamination of the cerebrospinal fluid.

THE TREATMENT OF SURGICAL AFFECTIONS BY LIGHT AND HEAT.

He who reads his journals and he who travels widely will be struck by the occasionally printed articles and occasional clinical demonstrations of the beneficial effect of light and heat upon a variety of pathological conditions. Perhaps these therapeutic agencies are most largely used and therefore have most conclusively proven their value in the treatment of chronic infections, and particularly those incident to the tubercle bacillus. Heliotherapy, applied

locally and under the direction of an enthusiast, to whom time is no object, has produced results which have even made the aggressive surgeon lay aside his knife. There is in such treatment, so directed, a strong psychic element, but in addition to this light and heat produce vascular changes which are important factors in restoration to normal.

It is to be remembered that during the war and in certain services it became the fashion to treat every wound by placing near it an electric light. The custom was never wide-spread and perhaps may not be continued now in a single hospital, but during the endemic of this practice there were a number of clear-headed, experienced surgeons who believed, and openly stated, that they had added to their armamentarium a potent means of overcoming infection and hastening wound healing.

The successful use of the Finsen light in curing lupus and the value of sun-baths in tuberculosis are attested by thousands of cases. Because of the undoubted benefit accruing from its use, the electric light cabinet, excepting for its bulk and its expense, would vie in popularity with the hot-water bottle. The so-called leucodescent lamp is almost a part of the household furniture in those families troubled by what they term rheumatism; nor have the activities of the dentists entirely abolished this source of enjoyment and comfort.

Hirsch (*Urologic and Cutaneous Review*, August, 1921) is well content with the effects produced upon an acute epididymitis by the light and heat treatment. He says: "Let us suppose the patient is before us with a most tender, swollen epididymis, seeking solace. He is first shown how to ap-

ply the broad, supporting adhesive strip. To save time Hirsch has found it expedient to have a photograph with the scrotum resting upon the adhesive strip and show it to the patient. This forms a definite picture within the patient's mind and much time is saved in the tedious process of description. The patient is then told to go home and get into bed and support the scrotum. Later the physician calls with the therapeutic lamp, which is suspended from the chandelier, or a string is run from the foot to the head of the bed and the lamp cord is tied to the suspension line at the correct point. Four or more thicknesses of gauze are wrung out in hot saturated magnesium sulphate solution and applied to the testicles. To start with, the lamp is so regulated that the heat is quite hot, although never warmer than the patient can comfortably tolerate, there being no advantage in burning the patient. A 100-watt blue nitrogen bulb is screwed into the socket of the reflector, which is placed one and one-half to two and one-half inches distant from the scrotum, depending upon the tolerance of the patient, the amount of heat supplied, the thickness of and the amount of moisture on the gauze dressings. The light rays have an unquestioned value, for those who have worked with this method will note that after the use of the electric pad, which supplies only dry heat, the effect cannot be compared with the therapeutic lamp."

It is worthy of note that one of America's most distinguished surgeons, who had suffered anguish from an infected arm, was relieved of his pain in a few minutes by heat and light applied through an electric lamp, and remains to this day a firm believer in the efficiency of the method.



Progress in Therapeutics

Medical Therapeutics

Treatment of Dysentery with Emetine.

In the *Journal of the Royal Army Medical Corps* for June, 1921, JEPPS states that emetine is highly toxic to man and other animals, and as it is necessary for the removal of infection of *E. histolytica* to employ the drug in doses of such size that there is in many cases a slight, and in some a severe, toxic effect on the patient, it is important to bear this in mind when considering the results of emetine treatment. In spite of the many series of results now published, in none of which is there any record of more than temporary ill-effects—the drug always being taken under close medical supervision and stopped when considered advisable by the medical attendant—there still seems to be a strong feeling in the minds of some against its use in any circumstances.

It does not appear superfluous, therefore, to give in some detail the observations made from this point of view on the present series of cases.

The patients having emetine hydrochloride injections were never troubled with vomiting or nausea, and no special arrangements were necessary in their case. One daily injection of one grain was given in the morning.

Those undergoing treatment with the emetine-bismuth-iodide mixture, on the other hand, profited by adherence to the following routine: They were not kept in bed; but were always kept on a very light diet during the whole course of treatment. The diet consisted of milk, bovril, fish without vegetables, bread and butter, and two eggs daily. After the men were in bed at night they received ten minims of chlorodyne, and half an hour later the dose of emetine-bismuth-iodide mixture in water. They were allowed to have hot tea after-

ward if they wished. In this way the vomiting and general discomfort were reduced to a minimum. Vomiting did occasionally take place, especially after the first few doses of a course, but the treatment never had to be abandoned on that account, as it was never serious. In one or two cases in which the first few doses had rather troublesome effects the treatment was stopped and begun again a few days later, with good results. Most of the patients had more or less diarrhea whilst under treatment. In some cases the patients had a saline or quinine wash-out daily for a week during the treatment; especially some with a raised temperature (to 100° or 101° F.). There were never any heart symptoms, excepting in one patient who complained of faintness, and pain in the region of his heart. It transpired that he had studied a little medicine, and thought he was being given chloral before the mixture. On his being reassured that it was chlorodyne, his symptoms completely disappeared. From the beginning of treatment the stools assumed a better character, and the condition of the patients themselves was much better after the twelve or twenty-four days of treatment. They all put on flesh, and their color and appetite improved.

In the whole series of treatments with emetine-bismuth-iodide mixture (seventy-five cases) the course had only to be stopped on account of serious diarrhea, and in one because the patient had a high temperature which was not attributed to any other cause. The amount of vomiting is dependent to a large extent on the conditions in the ward; a nervous or troublesome patient may easily upset several others, and tactful supervision may do a great deal toward preventing it.

The following conclusions are reached:

1. Salol-coated pills of emetine-bismuth-

iodide proved unsatisfactory; 45.1 per cent (at least) of twenty-six cases relapsed after a twelve-day course of thirty-six grains.

2. An emulsion of emetine-bismuth-iodide in liquid paraffin gave much better results. Of sixty-three cases given a twelve days' course of thirty-six grains only 12.7 per cent relapsed. After retreatment of a few of these relapsed cases with a double course, 11.1 per cent were still uncured.

3. Further analysis of these figures shows that of fifty-seven cases showing no intestinal symptoms, or only slight symptoms, 3.5 per cent had not been cured; while of six acute and subacute cases five, or 83.3 per cent, had remained positive.

4. Injections of emetine hydrochloride were found very useful in cases where the emetine-bismuth-iodide treatment could not be tolerated. Three out of five cases were cured by a course of twelve daily injections of one grain each.

5. The treatment proved beneficial to the patients' general condition; and there were no permanent ill effects.

Treatment of the Toxemia of Early and Late Pregnancy.

In the *Journal of the American Medical Association* of June 25, 1921, DAVIS states that the toxemia of late pregnancy is usually supposed to occur after the formation of the placenta and at least the period of viability. It may or may not be accompanied by convulsions. When these are absent, acute pain in the epigastrium, nausea and vomiting, violent headache, and sometimes disturbance of vision may precede convulsions. In this condition the presence of the fetus may become a complication, if there be a strong desire on the part of the mother to obtain a living child. Sometimes fear that a method of treatment may injure the child is an obstacle in the management of these cases. On the other hand, the statement that treatment will protect the child may assist greatly.

These are emphatically cases for hospital care. Symptoms of toxemia should be recognized, if possible, and alarm be taken

before the convulsions begin. On admission to the hospital, unless there is some unusual complication, bleeding and transfusion should immediately be done. Anesthesia is to be avoided, and local anesthesia can readily be employed before opening a vein. This should be followed by irrigation of the stomach and the leaving in the stomach of from one to two and a half grains of calomel, with sodium bicarbonate. The bowels should be thoroughly irrigated with hot sodium bicarbonate solution. The patient should be catheterized, and the urine examined. The blood obtained should be examined for blood urea, and a record kept of the findings and of the quantity of urine obtained by catheter. It is well to place the patient between blankets, and, if the skin does not act promptly, dry heat may be introduced beneath the blankets. Wet packs should be avoided, as they are depressing and tend to produce pulmonary edema.

The question of the employment of narcotics will at once arise. Their use will depend on the degree of nervous irritation present, and also on the extent to which the patient is unconscious. It is well to begin eliminative treatment first, for very often it will act as a sedative. If, however, there is evidence that the nervous system is suffering from the condition, then morphine, hypodermically, is indicated. If there is a tendency to bronchial catarrh, atropine also should be given, and if the action of the heart is greatly disturbed, digitalin may be added.

A vaginal examination is unnecessary at first, and is far less important than the treatment to secure elimination. When, however, this has been given, such examination should be made, the condition of the cervix being noted, and also the presentation and the position.

The old discussion as to whether these patients should be treated by the immediate emptying of the uterus still prevails. Davis does not believe that the immediate emptying of the uterus is indicated. Such a procedure does not invariably cause convulsions to cease, nor does it in the severest

cases, and in many others, materially improve the condition of the patient. There can be no question that labor is an irritation and may increase convulsions, and if the patient is in labor and labor is developing naturally, it should be expedited in the manner which will cause least disturbance and traumatism to the patient. In multiparous women, if the cervix is partially softened and dilated, the membranes may be ruptured. Labor will then proceed more actively, probably accompanied by the development of an increase in convulsions.

There is one exception to be made to the statement that the emptying of the uterus is not indicated in the toxemia of late pregnancy. When, in a primipara, the fetus is in good condition, the cervix unshortened, unsoftened, undilated, convulsions appearing or threatening, and the whole condition has arisen suddenly, immediate delivery by abdominal Cæsarian section is indicated, provided the fetus is at least viable, and preferably near term.

Another point of importance is the question of the necessity for absolutely preventing or limiting convulsions. If the convulsions were the important element in the case, then a patient who had the greatest number of convulsions would be most liable to die; but accurate and extensive observation shows that this is not true. A woman may die in the toxemia of late pregnancy without a convulsion, and others may survive from fifty to a hundred. Convulsions sometimes produce a favorable effect on the case; for they are followed by increased secretion, action of the skin and sometimes of the bowels, and in some cases the development of labor during convulsions seems to have favorable influence.

Four hours after the first eliminative treatment is given, intestinal irrigation should be repeated, and glucose and sodium bicarbonate solution should be left within the bowel for absorption. If there has been vomiting, the stomach should again be irrigated and magnesium sulphate in solution left within. The general condition of the patient as regards excitability and the state of the circulation should be observed, and

such medication given hypodermically as seems indicated.

Under such treatment the patient will grow better or worse. The occurrence of labor is also a third possibility. If the patient grows better, the bowels will act freely, the secretion of urine will be increased, and the blood-pressure will become less, if it has been excessive, and will become greater, if it has been deficient. The disturbance of the nervous system will subside and the patient will usually complain of thirst and sometimes of hunger. Milk and water, equal parts, may be given in small quantities as often as the patient will take it. The use of blankets to promote the action of the skin and irrigation of the intestine should be continued, the intervals of intestinal irrigation being gradually lengthened. No solid food should be given until the organs of elimination have acted thoroughly and the patient's general condition indicates the ability to digest food.

Defects in Obstetric Teaching.

In the *Journal of the American Medical Association* of June 25, 1921, POLAK states that the average graduate has been drilled in mensuration, abdominal diagnosis, watching the progress of normal labor, auscultation of the fetal heart, and in aseptic technique. He is a fair male midwife, nothing more. He is capable of delivering a multipara with an ample pelvis, and this he can safely do provided he is conscientious in his asepsis. If he is not, the woman is far safer to be confined without the presence of a physician than to have one who introduces bacteria from without.

Another reason why infection and invalidism follow so frequently in the train of parturition is an apparent lack on the part of the practitioner, as well as on the part of some specialists, of an appreciation of the actual physiology of pregnancy and the several stages of labor. This whole process has been fortified by every factor that nature can place there to prevent sepsis and to accomplish delivery without injury

to the child or the material soft parts; yet failure to observe the steps of this physiological process is of daily occurrence.

Certain obstetric truths cannot be too often repeated; hence, with the full knowledge that he is making statements that are known to all, Polak shows how nature has fortified the individual against infection in the normal course of labor.

First, the secretions of the normal pregnant woman are antagonistic to pathogenic bacteria, and during the latter weeks of pregnancy and until labor has actually begun, there is a tenacious plug of mucus in the cervix which stands as a barrier between the infective portion of the vagina and cervix and the sterile uterine cavity. Not until labor actually begins is this plug passed, and then the membranes become the barrier to invasion from below. The membranes have another function, and that is their hydrostatic action, which not only protects the child from uterine compression, but effaces, obliterates and dilates the cervix by a series of equable pressures which minimize the trauma to which this part of the uterus must be subjected. Only by their preservation can the integrity of the cervix be preserved and trauma minimized, which insures better tissue resistance; later, as the membranes rupture and the liquor amnii escapes, it carries with it and before it the bacteria which have reached the portico and entered the cervical canal. After the cervix has become sufficiently dilated to permit the passage of the child, the fetus comes through the cervico-vaginal canal, pushing everything before it, practically scrubbing the surface as it goes. The escape of the fetus is followed by a gush of hind-waters which further washes the canal from above downward, and this in turn is followed by the separation and expulsion of the placenta, which turns itself inside out through the ruptured membranes, thus keeping everything clean behind it. Furthermore, nature has added the protection of a bactericidal quality to the lochia, during the first twenty-four hours post-partum, while the uterus is contracting and retracting and closing the uterine sinuses.

No one can study these physiologic processes without being impressed with the natural precautions which are afforded the woman against infection from without. Yet practitioners feel that they can anticipate these normal processes—artificially dilate the cervix, prematurely rupture the membranes, traumatize the soft parts, expedite labor by forceps or version, reduce the natural resistance, and carry bacteria from the unsterile into the sterile zone without getting a resulting morbidity.

Every year some of our great teachers present and advocate before a body of specialists some method to shorten the process of labor, relatively safe in their hands but dangerous in the hands of those less skilled; for meddling in midwifery costs numberless lives. These suggestions appeal to the busy practitioner, yet were never intended for his practice. The time to recognize abnormalities, disproportions and complications is before they occur, in order that proper preventive treatment can be instituted.

The surgeon does not open the abdomen with a jack-knife which he takes out of his pocket: he prepares his field of operation, his instruments and his hands. He takes care to repair the damage he has done by controlling his hemorrhage, coaptating the edges of his wound because the quality of his work is judged by the result which the patient can see; but so far as Polak's investigation has gone, no obstetric condition is so formidable that the practitioner will not make a try at it at least. This is because he has not been taught, and the public has not as yet recognized, that obstetrics is a specialty—that the obstetrician must be an obstetric surgeon, who has had a training in the fundamentals of the science and the art of obstetrics, general and special diagnosis, and an appreciation of the principles underlying obstetric surgery. To entitle him to be considered as a specialist he has to produce a living child which has a reasonable certainty of life, and a mother who recovers without morbidity, and is restored functionally and anatomically to as perfect a state as she was in before she was delivered.

Volume Changes of the Cerebrospinal Fluid After Adrenalin, Pituitrin, Pilocarpine, and Atropine.

In the *American Journal of Physiology* for June, 1921, BECHT and GUNNAR make the following statements:

1. A method is described for measuring and recording graphically the amount of fluid in the skull under slightly less than the normal pressure.

2. Adrenalin does not increase fluid formation, because by this method it can be shown that the fluid flows out of the canal during the pressor stage of the action, but returns in equal amount while vascular readjustment is taking place.

3. In the same way it can be shown that pituitrin does not increase fluid formation.

4. In the same way it can be shown that pilocarpine does not increase fluid formation.

5. Atropine following pilocarpine may—but by no means always—produce increased arterial and venous pressure, accompanied by an increase in the amount of fluid forced into the bottle. The return of this fluid may be slow and tedious, but finally takes place. It is believed that this also is a purely mechanical change not accompanied by new formation.

Dermatitis and Allied Reactions Following the Arsenical Treatment of Syphilis.

In the *Archives of Internal Medicine* for June, 1921, MOORE and KEIDEL in summarizing their article on this subject state:

1. They have presented a study of twenty-three cases of dermatitis and allied reactions following the use of arsenical products in the treatment of syphilis.

2. Such reactions are equally frequent in either sex, but they are about three times as liable to occur in the white race as in the colored.

3. Evidence is presented that the lesions of syphilis or the duration of the disease exercise no modifying influence upon the incidence of dermatitis. Two of their

twenty-three cases occurred in patients in whom syphilis could be ruled out.

4. Dermatitis has been observed by them to follow all chemotherapeutic arsenic compounds which they have employed in the treatment of syphilis.

5. In the majority of cases in their series, arsenic was the only drug employed, so that mercury and potassium iodide as causative factors can be excluded.

6. Reactions of this group tend to appear early in the course of treatment.

7. In some cases certain prodromal symptoms may be recognized. These consist of itching, mild or fleeting macular, maculopapular, or vesicular skin eruptions, stomatitis, prolonged fever, or marked malaise. The occurrence of any of these during the use of arsenical products should lead to a suspension of treatment and a general survey of the patient.

8. Dosage, technique of administration, and impurities in the drug can be excluded as etiologic factors.

9. The lesions may be classified, on the basis of the constitutional manifestations and their importance, as mild or severe. In the mild group fall urticarial, erythematous, and herpetic rashes. In the severe group are the macular, maculopapular, and exfoliative rashes, itching, and stomatitis.

10. Urticaria is fairly common in association with the nitritoid crisis. The more severe constitutional manifestations are absent, and in most cases arsenical treatment may be continued. No patient so treated has later developed a more serious rash. The same may be said of herpes simplex and the erythematous rashes, except that in these cases fever and leucocytosis are frequently found.

11. The characteristics of the rashes of the severe group are described. Attention is drawn to characteristic alterations in the blood picture, which were present in fourteen of sixteen cases studied. The changes consist in general of leukopenia, decrease in polymorphonuclear neutrophils, eosinophilia, increase of the large mononuclear-transitional group, and the appearance of many fragile cells.

12. The complications of dermatitis exfoliativa, including acute nephritis, polyneuritis, jaundice, skin infection, bronchopneumonia, and septicemia, are discussed.

13. Attention is directed to the possible relation between the complications due to infection and the disturbance of hematopoiesis.

14. The sensitiveness of the patient to the drug causing the original reaction persists over long periods of time and is made manifest by even small doses of the same drug. However, certain patients, who cannot be accurately distinguished, are able to take other less toxic arsenical drugs without the development of reactions of this type.

15. The prognosis of these reactions is grave. Among their series of twenty-three patients there have been five deaths. The pathological picture is briefly described.

16. Patients with itching without skin lesions, and with stomatitis due to arsenical preparations, have been found to present a blood picture similar to that described in the exfoliative dermatitis group.

17. The literature is reviewed, and the possible etiologic factors in reactions of this group are discussed. The evidence is in favor of their anaphylactic origin.

The Oral Administration of Pituitary Extract.

In the *Proceedings of the Royal Society of Medicine* for June, 1921, HAMILL states that the dosage he usually employed was 0.5 to 1 Cc. of pituitary extract for animals of 3.5 to 4.5 kilos, corresponding to doses of the order of 10 Cc. in the human subject. Such doses are large, but are desirable in a general investigation. Much smaller doses, corresponding to about 3 Cc. for the human subject, have produced definite strong uterine contractions within half an hour.

Some observations on the human subject in delayed involution of the uterus have shown a diminution of blood loss whilst pituitary extract was administered, and recurrence when it was withheld. With doses of 1 Cc. three times daily, nausea, retching

and slight generalized colicky pains have been produced. These symptoms appear to correspond to the intestinal contractions and vomiting described. Attention has been called to these symptoms in man by other observers.

Animal experiments prove that pituitary extract administered by the mouth causes the characteristic uterine contractions.

Absorption takes place from the stomach and is more rapid when the stomach is full and actively digesting.

Large doses produce colicky contractions of the intestine and vomiting.

Clinical evidence harmonizes closely with animal experiment.

In view of the rapid absorption from the stomach and the fact that the intestinal juices rapidly destroy the active principle, it appears preferable that pituitary extract should be administered in solution and after meals.

Silver Arsphenamine.

The *Journal of Laboratory and Clinical Medicine* for June, 1921, in an editorial on this subject states that for some time accounts have appeared in medical literature of a new arsenic preparation used in the treatment of syphilis. This has been called "silver salvarsan," or more precisely the sodium salt of silver-diaminodihydroxyarsenobenzene, and it contains approximately 22.5 per cent of arsenic and 14 per cent of silver. It is presumed that the silver for which spirochetes have an especial affinity serves as an anchor for the arsenic, and that therefore the drug, despite its lower arsenic content than arsphenamine, is more active therapeutically.

Animal experimentation seems to show that silver salvarsan is twice as effective as the old salvarsan (606) and three times as effective as neosalvarsan (914). Kolle states that silver salvarsan is old salvarsan in active form plus silver, and that 0.25 silver salvarsan is the equivalent of 0.4 of old salvarsan.

Dreyfus in discussing his experience with this drug in the treatment of syphilis of

the nervous system says that silver salvarsan is three times as efficacious as the old salvarsan, that it acts more quickly, its toxic dose is higher, and it has the advantage of a combined silver and arsenic effect. He says that in nervous syphilis the indications are that the new preparation promises to be more valuable than the older ones, even when the latter are used in conjunction with mercury. It is Dreyfus's experience that, especially in early cases, both subjective and objective symptoms show marked signs of retrogression within two weeks. More care is necessary in tabes than in other conditions, but in all small doses with carefully graduated increases are used.

Boas and Kissmeyer, after treating 62 cases representing all stages of syphilis, and using mercury with it, found that silver salvarsan was just as effective as old salvarsan, and in addition it was more soluble and easier to handle. They prefer it for these reasons only. Körsbjerg on the other hand is very enthusiastic over the new drug and has been so impressed by its effects that neither he, nor his chief Jersild, uses mercury either as an accompaniment or as a follow-up treatment. There were 32 cases in the series reported, of which 19 were secondary. In every case all symptoms had vanished within two weeks of the first injection.

The use of this silver-arsenic preparation seems from the reports to be attended by more danger than the older preparation. This danger is reflected in the dosages used—*i. e.*, from 0.02 to a maximum of 0.25, in dilute solution. Anaphylactoid symptoms—redness and swelling of the face and buccal mucous membrane; pyrexia; cutaneous eruptions which are usually transient, and occasionally severe dermatitis; syncope, collapse, vomiting, vertigo and headache, and icterus are all listed as secondary effects.

Neurorecurrences seem from reports to be fewer after silver salvarsan than after the older drugs, but the cases are too few to be decisive.

A large series of cases treated with silver salvarsan is that of Behring, who reports upon his experience in giving 3200 injections

in 259 cases. In this series icterus occurred nine times, and angioneurotic symptoms six times. There was one death. In his experience no venous thrombosis occurred. Eruptions and icterus were not more commonly observed after silver salvarsan than after the older preparations. Silver salvarsan is well adapted to the abortive treatment of syphilis. Behring says that a definite verdict cannot as yet be given with reference to tabes and central syphilis, although tabes is apparently favorably influenced.

Wiener says that the curative effects in primary lesions, secondary and tertiary symptoms are very favorable and apparently not inferior to the results of a combined course of neosalvarsan and mercury in the customary dose.

The most recent report on this silver-arsphenamine is based upon the experience of Major Watson of the Medical Corps, U. S. A., and has to do with the treatment of 800 patients, and more than 6000 injections. The method of treatment recommended by the Board of Medical Officers, and the method used by Watson, was as follows:

An interval of seven days between each dose in each course of treatment. Treatment to consist of four courses of silver salvarsan and gray oil.

In the first course of treatment the first dose to be fifteen hundredths (0.15) gm. of the drug. The second dose to be two-tenths (0.2) gm., and each of the remaining five doses of the course to be three-tenths (0.3) gm. of the drug.

At the end of the first course of treatment a Wassermann blood test is made and then thirty days' rest.

In the second course of treatment three-tenths (0.3) gm. of the drug is given at each of seven injections, at seven-day intervals, and is followed by two and one-half months' rest.

The third and fourth courses are the same as the second, with ninety days' interval between the two. Gray oil is used in conjunction with and at the same time as each injection of silver salvarsan, using eight hun-

dredths (0.08) gm., by intramuscular injection.

A blood Wassermann is recommended after each course and a spinal fluid Wassermann after the second.

Such is the army intensive treatment. As against it Hoffmann says that one complete intensive course of treatment with mercury and silver salvarsan in primary syphilis will give a complete cure. Hoffmann, Neisser and Scholz believe that if treatment can be commenced in the prepositive Wassermann stage the disease can be cured in from 80 to 100 per cent of the cases. Nevertheless it is to be borne in mind that all persons who have had syphilis, no matter how rapidly the clinical signs disappear, nor how soon the Wassermann reaction becomes negative, should be watched both for clinical and serologic recurrences.

It seems from a review of the literature that in silver-arsphenamine we have a more potent antispirethetide than any heretofore in use, and one which should be used with the greatest care. It seems to represent a real therapeutic advance.

The Treatment of Acute Toxemia.

In the Correspondence columns of the *British Medical Journal* of June 4, 1921, REID in considering lobar pneumonia states that a portion of the lung is invaded by the pathogenic organisms; blood is extravasated; and that portion of the lung becomes more or less solid. The temperature rises, rigors occur, the patient suffers from headache, sleeplessness, and a general feeling of illness. The severity of the disease is not at all strictly proportionate to the amount of lung involved, but depends rather on a toxemia which especially affects the heart and breathing centers. In favorable cases a "crisis" occurs about the fifth to the tenth day. Commonly the patient sleeps, and awakes some time later feeling much improved. His temperature has fallen, his headache, rigors and sleeplessness have gone, and he is bathed in sweat. Apparently the condition of his lung has not

altered; but later gradual resolution occurs, and the extravasated and disintegrated blood is voided as "rusty" sputum.

Sweating is nature's mode of cooling the healthy body by evaporation from the surface. But if, as usually happens in pneumonia, the patient is thickly covered with bedclothes and evaporation prevented, the temperature still falls. Presumably, therefore, something more than mere exudation and evaporation of fluid occurs in the crisis—something which in itself causes the fall of the temperature and the general improvement. He can conceive no reason for such a sudden change except a quick elimination of toxins, and in view of the lack of evidence of increased activity in other possible channels of elimination, he cannot conceive by what road the toxins can be passed out if not by the sweat. He knows of no evidence that toxins have been found in the sweat; but then, he says that he does not know that they have been sought there.

Since recovery from acute diseases is associated with a falling temperature, moisture of the skin, and sleep, the administration of antipyretics, sudorifics, and soporifics was formerly common. But the medicines and the dosage generally employed depressed the heart and breathing centers, and of late it has been regarded as almost axiomatic that antipyretics and sudorifics are injurious under such conditions.

But if we give a patient suffering from pneumonia, and not already poisoned past redemption, a dose containing aspirin 10 grains, phenacetin 5 grains, and pulv. ipecac. co. 5 grains, we get (as far as his experience goes) what has all the appearance of an artificial crisis, without depression of the heart and breathing centers, or any other ill effects. The patient soon falls asleep, and wakes up some hours later feeling much better, bathed in sweat, his temperature down, his rigors and headache gone, and his pulse and breathing improved. The signs of illness will gradually return, but they can be abolished in the same way once or twice a day till permanent improve-

ment sets in. On such occasions the patient will be relieved and rested, and, unless his experience has been unusual, his illness shortened.

The Action of Quinine on Pregnant and Non-pregnant Uterus in the Tropics.

FISHER, in the "Memoranda" columns of the *British Medical Journal* of June 18, 1921, states that in tropical countries some medical practitioners advise pregnant women to give up prophylactic doses of quinine as soon as pregnancy begins. The result is in many cases that chronic malaria causes severe anemia and abortions; should the mother go to full term the children are badly nourished and have to be artificially fed owing to the poverty of the mother's milk, and unless both are removed from tropical regions there is great danger of the loss of their lives.

As with some women 5 grains of quinine cause contractions of the pregnant uterus and sometimes hemorrhage, he advises that the 5-grain prophylactic dose be taken in two doses of $2\frac{1}{2}$ grains morning and evening, and in his thirty-two years' experience in Central Africa (11th deg. S. lat.) he has never seen a case in which this has done any harm, and in nearly every case the 5 grains have kept the women free from active malaria until the confinement. Then as the vital powers of resisting disease are much lowered by the excessive fatigue of child-bearing, it is necessary to give 10 grains (in very small doses) a day for five or six days, as very often, if not given, a severe attack of malaria will delay recovery.

He has never found quinine to cause abortion. On the other hand, he has treated cases of abortion in native women (who do not take quinine), in which the frequent abortions were undoubtedly caused by chronic malaria, for when given the above prophylactic doses they were able to go to term and give birth to healthy living children.

With regard to the effect of quinine on the non-pregnant uterus, undoubtedly in a small percentage of cases it causes excessive

and too frequent periods. Years ago he found that when 5-grain doses of quinine caused deafness or noises in the ears it was a sign that a smaller dose (3 grains) was sufficient as a prophylactic, and the majority of women under 120 pounds weight will, he thinks, find this smaller dose will keep them free from active malarial manifestations.

Recently he has treated this menorrhagia also as a sign that only smaller doses of quinine need be taken, and if the 5-grain prophylactic dose is necessary it should be taken in $2\frac{1}{2}$ -grain doses twice a day; the few cases treated, however, are not sufficient to lead him to any definite conclusions.

Treatment of Acute Methyl Alcohol Poisoning.

In the *Ohio State Medical Journal* for July, 1921, ISAACS states that various treatments have been recommended. These consist of stimulants, as caffeine, adrenalin, strychnine, digitalis, camphor, oxygen, pilocarpine, and also potassium iodide. Gettler and St. George suggest saline or sodium bicarbonate infusions and phlebotomy, with repeated gastric and rectal lavage. Fenton reports a case of blindness in which the patient recovered after the instillation of ethylmorphine hydrochloride (dionin) into the eyes. The patient was taking sodium bicarbonate freely by mouth. Harrop and Benedict report the recovery of a patient following 5-per-cent solution of sodium bicarbonate intravenously.

The plan of treatment is based on alkalinization and elimination. If the patient is not comatose, and is received within twelve hours after taking the wood alcohol, it is well to pass a stomach tube and wash out the contents with a 1- or 2-per-cent solution of sodium bicarbonate in warm water, as experience has shown that some of the alcohol is excreted into the stomach. Three or four ounces of a 50-per-cent solution of magnesium sulphate solution are then poured in through the tube and left in the stomach. Sometimes an hour or more after washing the patient will vomit a consider-

able amount of food débris having a marked odor of methyl alcohol. The patient is put to bed, kept warm if his temperature is low, and is given 3 grm. of sodium bicarbonate, with about 250 Cc. of water every two hours, for about six doses, being awakened for his medication if asleep. Sometimes a whiff or two of aromatic spirit of ammonia will serve to awaken the patient enough to make him swallow. The dose of bicarbonate may be doubled without apparent ill effects. After this the patient is given 3 grm. of sodium bicarbonate with a glass of water, three times a day, one hour before meals, until the symptoms have disappeared. A safe guide as to the dose is to keep the fresh urine alkaline to methyl red. Fluids are forced, and a liquid diet is given until the acute symptoms are over. Then the diet may be as varied as the patient wishes.

If the patient is comatose, or if the cyanosis is very marked, with respiration much depressed, it is well not to wash out the stomach at first. In this case, or if medication by mouth is not retained, 1000 Cc. of Fischer's sodium bicarbonate (0.37 per cent) sodium chloride (1.4 per cent) solution at 99° F. is given slowly intravenously. In case of any doubt, it has been his custom to give the intravenous injection. No ill effects have been noted. If there is time and there seems to be congestion of the venous circulation from embarrassment of the right side of the heart, it may be well to draw off from 100 to 300 Cc. of blood before giving the intravenous injection. Half may be given at one time, and the other half later. It has usually not been necessary to give a second intravenous injection on succeeding days. A spinal puncture may be made if there is much restlessness and if there are signs of cerebral compression. After Fischer's solution there appears to be a dehydration of the nervous tissue, with increase in spinal fluid. The breathing usually improves rapidly, the mental state clears, and in from six to twelve hours the cyanosis has virtually disappeared. There is rapid improvement in the eye signs, the blurring of vision disappearing in from twelve to twenty-four

hours, or sometimes a slightly longer period. The abdominal tenderness soon disappears.

It is well for the patient to remain in bed until the cyanosis has disappeared and the mental confusion has cleared. The bowels should be kept open with magnesium sulphate. The average stay in the hospital was about five days, with treatment for two or three days. It is well to have the patient return at intervals to note whether or not there has been any permanent damage.

Conservative Tendencies in Modern Gynecologic Therapy.

EHRENFEST in the *Journal of the Missouri State Medical Association* for July, 1921, states that though information at present available concerning the rôle played by functional disturbances of the ovary, and probably of other endocrine glands, in the etiology of gynecologic anomalies is still decidedly limited in its scope, definite changes in the conception of the rationale of some of the usual operative and non-operative methods of treatment are necessary. First, curettage and the use of caustics on the endometrium, especially in the treatment of uterine hemorrhage, are hardly justifiable procedures. We realize now why these procedures so rarely have yielded a satisfactory result. Secondly, the empirically established effectiveness of certain therapeutic measures must be explained in a different manner. The relief of that most common of gynecologic symptoms, hemorrhage, is obtained only in so far as the operative or non-operative procedure reduces or eliminates abnormal stimulation of the ovaries, by reducing pressure (as in correction of malpositions), by stretching or breaking adhesions, and by reducing inflammatory irritation.

A third deduction might be reasonably drawn from this better understanding of the etiologic significance of disturbed ovarian function: It should be possible to counteract the effects of a deficiency of ovarian hormones by the administration of ovarian extract, or, in view of the assumed

interaction of the entire endocrine system, it should be possible to stimulate or retard, respectively, ovarian function, as required in the individual case, by the administration of hormones extracted from other endocrine glands, which are supposed to work as synergists or as antagonists of the ovaries.

He refrains from discussing adequately the complex problem of gynecologic organotherapy. Personally he acknowledges a certain value of some of the ovarian extracts in the satisfactory relief of certain symptoms and functional anomalies. He is convinced that our definite information in regard to interglandular reciprocity and harmony, synergistic and antagonistic activity, etc., as established by scientifically correct investigations, is far too limited to place gynecologic organotherapy on any definite basis. Those employing these extracts singly or in fantastic combinations should realize more clearly than they seem to that they are merely experimenting with substances which in some conditions at times seem effective. The fact should not be forgotten that all scientific experimental proof is still wanting that any one of the numberless commercial preparations on the market actually contains, and thus is capable of actually replacing, all the hormones normally supplied by the gland whose dysfunction in the individual case is held responsible for the existing pathology.

Fortunately, even the most enthusiastic organotherapists concede that endocrine dysfunction is not always the cause but occasionally only the result of impaired health or of a state of temporary debility. The gynecologist is well aware of this fact. He knows that the ovaries prove almost specifically sensitive in this respect. Secondary amenorrhea, the very obvious evidence of suppressed ovarian activity, is commonly observed in certain types of brain tumor, in tuberculosis often before the disease itself has become manifest, in diabetes, in cachectic patients, or in those recovering from typhoid or other debilitating diseases. From this point of view the importance and value of general hygienic-dietetic measures in the treatment of gynecologic functional

anomalies can be better appreciated. It is noteworthy that in a recent work its author, probably the most extravagant enthusiast in gynecologic organotherapy, emphasizes the necessity of hygienic measures during the administration of the various combinations of organ extracts specifically required by the various gynecologic anomalies.

Treatment of Acute Cardiac Failure.

O'BRIEN in the *Boston Medical and Surgical Journal* of July 7, 1921, states that the treatment varies with particular conditions, and some hearts fail so quickly that no treatment can be given. He refers particularly to lesions diagnosed post mortem as embolic plugging of the pulmonary artery; an impaction of ball thrombus in a narrowed mitral orifice; in a rupture of heart wall; in rupture of an aneurism; complete heart block; convulsions in Stokes-Adams disease; and in auricular fibrillation. In passing, he says that the deaths by chloroform and electrocution are proven to be due to ventricular fibrillation.

Accepting the fact that "overload" is cause of attack, in most cases, all treatment must be based upon common sense, and removal of physical and mental strain is the first logical thing to do.

Rest is of greatest importance, and should be mentioned first, and be insisted upon. The plans and wishes of the patient must be disregarded, and, if symptoms are at all severe, absolute rest in bed is necessary. Failure to get satisfactory results is usually due to mismanagement of a case rather than to error in selection of the drug. Much of the praise and faith bestowed upon digitalis and allied drugs might well be given to thorough rest. While the patient should be permitted to assume that position which gives most comfort in bed, a semi-prone position, or even an upright one, is advisable, and the use of a bed-rest should be insisted upon, to give greater comfort, and thus avoid the physical strain of frequently readjusting the pillows.

Diet, baths, graded exercises, etc., are

most important in the convalescent stage, and call for careful supervision on the part of the attending physician.

Drug treatment involves the personal equation, and one cannot be exact as to dosage, selection of drug, etc., on this account. The correct diagnosis and particular situation as regards sex, age, size, complications, etc., must be considered in each case.

Venesection is clearly indicated when the patient is greatly cyanosed, dyspneic, coughing, and raising bloody sputum. There is absolutely no danger in drawing off blood at this stage, and wonderful results often follow, as drugs certainly are made more active thereby.

Morphine, best combined with atropine, to relieve muscular spasm and also to prevent the depression which so often follows use of opiates, is indicated in good-sized doses in angina and similar conditions to relieve pain and to quiet the frightened patient.

"Aseptic ergot" has been strongly recommended for heart failure, in subcutaneous doses, as a substitute for digitalis, but should not be used as an emergency measure.

Camphor-in-oil, also given subcutaneously, has been a favorite in the last few years for emergency stimulation; but while it has some value it is not worthy of the confidence bestowed upon it, and ranks far below some other drugs in practical use.

Adrenalin is fleeting in action, and not dependable, and the same statement might be repeated for pituitary extract, as emergency measures.

Alcohol, while popular, is not a true circulatory stimulant, and the great faith in its ability to do the impossible, as held by laymen, is not shared by the medical profession.

Aromatic spirit of ammonia has fleeting action, is a mild stimulant, possesses irritating qualities, and may have some virtue in a simple faint, but it certainly does not qualify as a heart stimulant for emergency work.

Strychnine is popular, but undeservedly

so, as it fails to produce results in acute cardiac failure.

Amyl nitrite, nitrites of sodium, nitroglycerin, etc., are also fleeting in character, have a distinct value in angina pectoris, but are valueless otherwise.

Caffeine has some vasodilator properties, but acts more as a diuretic, and is not an emergency measure.

Cactus grandiflora, squill and sparteine sulphate have value, and when well chosen for selected cases, as for patients having idiosyncrasies for digitalis or strophanthus, or when the cumulative effect of digitalis appears and it becomes advisable to discontinue it for a while, cactus or sparteine is very dependable.

Thyroid extract has been known to help heart-block, by giving sufficient amount to produce a tachycardia. This may work all right from a theoretical point of view, but not enough cases have been reported to justify an opinion as to the real value of this method.

Convallaria majalis (lily-of-the-valley), adonis vernalis, apocynum cannabinum (Canadian hemp), have value as heart stimulants, but, like others mentioned, are not drugs for emergency in acute heart failure.

Digitalis is one of the most dependable and widely used drugs in medicine to-day, but acts too slowly for emergency use. It best serves its purpose in cases of failing compensation, and if used in acute cases it should be restricted to those wherein immediate results are not necessary.

Radiotherapy in Non-malignant Gynecologic Diseases.

In the *Journal of the Missouri State Medical Association* for July, 1921, GELLHORN states that the use of x -rays and radium has revolutionized the treatment of climacteric hemorrhages and of fibroids. The former, unless they are caused by cancer, can be cured almost without exception by either of the two agents or a combination of both. Of the fibroids, more than three-fourths of the cases are suited for radio-

therapy; and in these a clinical cure consisting of cessation of bleeding and shrinkage of the tumors can be produced in 98.4 per cent. In these cases, then, radiotherapy, which has no mortality whatever, is infinitely superior to surgical treatment, which is still burdened with an average mortality of about 5 per cent. There are, however, cases of fibroids left which should be treated only by operation. The indications for both procedures are to-day sharply defined. Either one or the other gives the better result, and hence has to be employed to the exclusion of the other. The man who administers radiotherapy indiscriminately disregards the best interests of his patients as much as the man who adheres exclusively to surgery.

Treatment of Piles Without Operation.

EADIE, in *The Practitioner* for July, 1921, states that a mode of curing (he uses the word advisedly) piles without operation, which receives far less attention from the medical profession than it merits, is the so-called injection method—the interstitial injection of each individual pile with some fluid such as carbolic acid. This neglect is perhaps the more strange when one takes into account the large number of sufferers from hemorrhoids in the profession who have themselves been successfully treated by this means. The technique is simple, and can be carried out in one's own consulting room; the results are immediate and excellent; an anesthetic is not needed; the patient does not require to lay up, but can get about his ordinary vocation.

During the last eighteen years Eadie has given, in hospital and private practice, many thousands of injections, and is convinced that when properly done the results compare favorably with the best of other treatments. So far he has never experienced any of the dangerous effects, such as septic thrombosis, which it is surmised should occur, but do not.

It is, in his opinion, the treatment of election for hemorrhoids, and can be practiced in all cases in which the rectal speculum

can be introduced. It is especially valuable where operation is contraindicated.

He would relegate to operation only those few cases in which for some reason the speculum cannot be used without a general anesthetic; or when an anesthetic has to be given for some intercurrent condition the piles can be removed at the same time.

The technique adopted is briefly as follows: The patient lies on his left side, with the thighs fully flexed, on a firm couch or table, preferably at least 2 feet 6 inches high. The perineum is exposed to a good light. On the first occasion of seeing the patient one observes carefully for prolapse, sentinel pile, fissure, etc.; and besides examining the rectum digitally *re* stricture, prostatic enlargement, etc., it is well to make a general examination to elicit, if possible, the cause of the piles. The latter are demonstrated in the lumen of a warmed and vaselined proctoscope introduced into the anal canal, and each pile is then punctured by the needle of a syringe, and 3 to 5 minims of the injection fluid instilled. (The fluid he uses is acid. carbolic. 10 parts, hamamelis 10 parts, aqua dest. 80 parts). Three piles may be treated at one time. The anal canal is then swabbed dry of any injection fluid that may have escaped into it. The speculum is entirely withdrawn. The perineum is swabbed free of lubricant. The patient gets up and dresses, and goes about his business. The time taken from introducing the speculum to the final swabbing of the perineum does not in his own practice exceed 30 seconds.

The patient is instructed that he may expect a feeling of something having been done, not amounting to pain, and that his part in the performance is to avoid alcohol, condiments, and tobacco, and to eat plenty of fresh fruit and vegetables. He is also to take pains to keep the piles from prolapsing during the twenty-four hours subsequent to injection. Should he omit to do this the prolapsed pile may become inflamed and painful, which is no part of the treatment.

Treatment in like manner is given two or three days later, and repeated twice or

thrice a week until piles are no longer demonstrable through the speculum. An average of about nine treatments more or less is, in his experience, necessary. Pile patients complain chiefly of bleeding and prolapse. Many experience much relief after the first treatment; most feel cured after four. Piles can, however, be demonstrated in the anal canal after the symptoms have disappeared, and will eventually trouble the patient unless dealt with.

There appears to be a tendency for other veins of the anal canal to become varicose when the supporting pressure of the piles is removed, and, by seeing the patient from time to time, one can inject these as they show in the speculum, and before they give rise to symptoms. He therefore likes to keep the patient under observation for a year, seeing him every two or three months.

Most sufferers from hemorrhoids complain of constipation, and it is remarkable how this disappears with the piles; indeed, it is quite exceptional for it not to. He asks patients to leave off all purgatives.

He refers to the treatment of internal piles—i. e., piles covered by mucous membrane. He regards external piles (those with a skin covering) as the outward and visible expression of internal, and as the latter disappear so do the former either completely shrivel away or leave a remnant as a skin-tag, which, if need be, may be snipped off.

The untoward effects very occasionally following an injection are:

(1) *Pain*. This may result from: (a) Injecting an inflamed pile. This should be avoided, and no injection given until inflammation has subsided. (b) Injecting a prolapsed pile and either not returning it into the rectum or allowing it to prolapse again and become strangulated. The patient should take some trouble to keep a prolapsing pile up for twelve hours after its injection. After a few injections, often after the first, the tendency to prolapse will cease. (c) Injecting too low in the anal canal, where the latter is supplied by nerves from the perineum. It is well to start injecting high up and gradually work down-

ward, leaving the lower inch of the anal canal till the end of treatment. By so doing that part will probably require no injection at all.

(2) *Sloughing* of the mucous membrane. This will result from too superficial an injection. The sloughs are small, and, although he has not known any harm from them, are undesirable. He endeavors to inject about $\frac{1}{4}$ inch below the surface of the mucous membrane.

(3) *Urinary irritation* may result from injecting in too close proximity to the urethra or prostate. It is not usually severe and passes off in an hour or two.

Prognosis after this treatment is, in his experience, as good as after operative measures. If the original cause of the piles, such as an enlarged prostate or cirrhotic liver, is still operative, then a recurrence is likely sooner or later whether the patient is treated by injection or operation. It is, however, a very simple matter to give a few further injections from time to time as the need arises.

Incidentally, he has been using this injection treatment for pruritus ani with very gratifying results.

[It is to be recalled that this method was extensively used by Kelsey many years ago, but seems not to have met with general favor—ED.]

Acute Postoperative Dilatation of the Stomach.

NOVAK in the *Journal of the American Medical Association* of July 9, 1921, states that the treatment of acute postoperative dilatation of the stomach, to be successful, must be instituted early. There are few postoperative complications in which prompt recognition is so important to the patient. The diagnostic features of the condition have already been discussed. The two principal measures for the relief of the gastric dilatation are briefly as follows:

The stomach-tube has saved the lives of many patients who have developed postoperative dilatation of the stomach. This fact has not always been appreciated, for,

as has already been stated, many a case of gastric dilatation has been wrongfully diagnosed as peritonitis. Fortunately, however, the stomach tube has often been used just the same, to the advantage of these patients. Certainly gastric lavage should be carried out in every case of postoperative dilatation, first for diagnostic and later for therapeutic purposes. In some the distention of the stomach is so great that the tube must be introduced much farther than usual in order to evacuate the contents. Payer has advised the employment of lavage in the elevated hip posture, in order that advantage may be taken of the factor of gravity in facilitating complete evacuation of the stomach. The frequency with which the lavage is to be carried out depends on the amount of gas and fluid evacuated. This, as has been seen, is often very great, owing to the extreme degree of hypersecretion present in many cases. In such cases lavage is often necessary at intervals of every few • hours. When the lavage treatment is instituted early, the results are as a rule very gratifying; when begun late, the treatment may prove of little avail. According to Borchgrevink, in forty-eight cases treated by lavage alone, twenty-four patients got well and twenty-four died. The latter group undoubtedly, however, embraced some late and some complicated cases.

The postural treatment was originally suggested in 1895 by Schnitzler, and has been carried out in a large number of recorded cases. It is based, of course, on the theory that the dilatation is the result of duodenal occlusion by the mesentery, and that this can be relieved by placing the patient in the prone or elbow position, thus lifting the intestine and mesentery off the duodenum, as it were. The results reported from the method have been, in the main, favorable, although it is by no means invariably successful in the relief of the symptoms. The method is still employed, even though, as we have seen, there is little doubt as to the incorrectness of the theory on which it is based. It was used in two of Novak's cases with satisfactory results. In one case the relief given to the patient by

being placed in the prone position was immediate and striking, in the other it was less pronounced but quite definite.

The good results of this position are not to be taken as a proof of the correctness of the duodenal occlusion theory. Certainly the evacuation of the stomach by vomiting is prompted by the assumption of these postures irrespective of the presence of a mechanical block in the duodenum. It should furthermore be mentioned that in many of the cases in which postural treatment was resorted to, gastric lavage was employed synchronously. Aside from the prone and knee-elbow position recommended by Schnitzler, other forms of postural treatment have been suggested. Robinson and Müller recommend placing the patient on the right side to facilitate emptying of the stomach into the bowel. Payer, indeed, advises placing all patients on the right side as a prophylactic against this complication. Kelling's suggestion, on the other hand, is to place the patient on the left side, thus overcoming the valve-like closure of the cardia to which he attributes the dilatation. This conception is probably erroneous, and the Kelling posture is not to be commended. Finally, allusion has already been made to the apparently worth-while recommendation of Payer, to place the patient in the elevated pelvic position during lavage, in order to empty the stomach more completely.

From the standpoint of both rational and of clinical results, Novak believes it may be stated that there is no place for operative measures in the treatment of acute dilatation of the stomach. Various forms of operation have been done in an effort to relieve the condition, but the results have been so unfavorable as not to justify them. Doolin found that of thirty-one patients operated on, only eight recovered. The following operations were done in this series: gastrotomy, six cases, with five deaths; gastrostomy, seven cases, with six deaths; gastroenterostomy, seven cases, with four deaths; jejunostomy, one case, one death; exploratory laparotomy, eight cases, five deaths. He concludes:

1. Acute postoperative dilatation of the stomach is an important and dangerous surgical complication which is probably less infrequent than is generally believed.

2. Its early recognition is of vital importance to the patient, for on it, to a large extent, depends the success of treatment.

3. The use of the stomach tube is the most important means of diagnosis.

4. Especially important is the differentiation between gastric dilatation on the one hand, and peritonitis or postoperative ileus on the other.

5. Dilatation of the stomach is a frequent concomitant of peritoneal infection.

6. The evidence points strongly to gastric paralysis as the immediate cause of the dilatation.

7. In the primary cases, such as those occurring during operation, the gastric paresis is explainable as a simplex reflex. In the secondary cases the dilatation is the result of septic factors, although it is possible that occlusion of the upper intestine may in rare cases be the primary factor.

8. The two important therapeutic measures are gastric lavage and the postural treatment advocated by Schnitzler. The latter is incorrect in theory, but often successful in its results.

9. There is no place for operative measures in the treatment of acute postoperative dilatation of the stomach.

Albert J. Ochsner, in discussing the paper of Dr. Novak, stated that the symptom which the nurses recognize first is the effect of the dilatation on the heart. The heart is displaced. The nurse notices that the heart has "gone bad" and thinks that something has happened, but does not recognize the cause. For many years he had occasional cases of acute postoperative dilatation of the stomach. Now he has a standing order that the moment a patient vomits, or is nauseated, or complains of gas pressure, gastric lavage is made with water at a temperature of 105° F. The heat stimulates contraction of the stomach and cleanses it of any jejunal contents which may have regurgitated into the stomach. For the last fourteen or fifteen years since this routine

has been followed, he has had no further cases of dilatation. Placing the patient across the bed on the face is the first thing the nurse should do; then the stomach-tube is passed and the stomach washed out.

The Tonsils and Scarlet Fever.

BULLOWA, in the *American Journal of Diseases of Children* for July, 1921, in concluding an article on this topic says that the statistics and the cases he narrates lend support to the view that the inflamed tonsil is a focus of infection and that the cervical lymph nodes enlarge from it in scarlet fever just as they might enlarge in the absence of scarlet fever. The inflamed tonsil becomes a phlegmon on the wall of the pharynx.

Rhythmic swallowing movements when they compress the tonsils force toxins or organisms into the lymph stream with subsequent inflammatory reaction in the adjacent lymph nodes.

Prophylactic removal of the tonsil when buried, or covered with plica, or incision of the plica so as to uncover the tonsil, prevents some of the severe complications arising from this source.

Painstaking observation of the tonsil during scarlet fever is helpful, and leads to the view that the infection is conditioned by the anatomical relations.

In certain selected cases tonsillectomy may be performed with benefit during scarlet fever.

The Schellberg Treatment for Chronic Colonic Infection.

GALLAND, in the *New York Medical Journal* of July 20, 1921, states that the treatment perfected by Schellberg from his original method has for its fundamental principle the use of lavage by which all parts of the large gut can be reached and cleansed by antiseptic solutions. Following the cleansing and the disinfection of its walls, he has carried the treatment to a cure by adopting nature's means of preserving the balance of power to the bene-

ficial organisms by planting in the cleaned and sterilized gut pure, healthy cultures of *bacillus bulgaricus* and *bacillus acidophilus*.

The treatment employed calls for a special but not complicated equipment: A three-gallon irrigator connected with a three-quart irrigator; a forty-six-inch rubber rectal tube stiff enough not to bend on itself or be blocked by intestinal pressure, the tip sufficiently flexible to pass around the flexures of the colon; pure culture of the *bacillus bulgaricus* and *bacillus acidophilus* in the incubator for seventy-two hours; culture tubes for obtaining growths to determine the character of the intestinal flora.

The most satisfactory solution for the large container is found to be one-tenth-of-one-per-cent chlorazene, as chlorazene does not absorb readily. The temperature of the liquid in the large container should be kept at 37°C. One to eight thousand collene (a colloid of silver), or one to thirty thousand chinisol, may be used in the smaller tank; the temperature of this solution to be kept at 52°C. for use. The irrigators should be placed at least three feet above the patient. A large connecting tube from each passes through a three-way valve connection. This in turn is connected to the rectal tube. If one wishes to inject an oily substance, such as kerosene or turpentine, a ten- to 20-per-cent ichthyol solution as a medium should be used. This emulsion is best forced through the rectal tube by a hard-rubber syringe. The giving of a cathartic will aid in the cleansing process.

The observation has been that the sigmoid lies most generally in the central line, the normal inclination being to the left side; a few have been found on the right. As a rule, Schellberg begins the irrigation with the patient lying on the left side to gain the slight advantage of gravity. With the rectal tube completely filled with the solution from the large tank, taking great care that all air is expelled from the tube, the tip is introduced into the rectum. Allow ten ounces to flow into the rectum, shut off, and permit the gas and any fecal matter present to escape. When the rectum

is clean of feces, turn on the water, dilate the gut, and begin feeling the way up into the intestine with the tube. Never try to advance the tube without the water flowing. After proceeding a distance, it is wise to shut off the flow and allow the expulsion of the bowel contents. Again turn on the water and proceed to advance the tube further. Go slowly, be gentle, persevere, and the ascending colon will be reached, and possibly even the cecum, no matter how misplaced, ptosed or pocketed the gut may seem. Gentle perseverance with the water pressure will allow one to reach the goal, unless there is some growth obstructing the gut.

One must learn to differentiate the feel between the tip of the tube striking a fecal mass and the wall of the intestine. If one does not learn to differentiate, he will not have great success with the procedure. As the water flows into the bowel, with one hand on the patient's abdomen, the operator can easily trace the gut as it fills, except where the abdominal walls are very thick and the intestine lies close to the back. Even in such cases practice will enable one to detect and trace it. When the tube has reached the splenic flexure, place the patient on his back, and, by the aid of the water pressure, make the turn. With a little patience the tip of the tube will pass that turn into the transverse colon. Here one may need to turn on the solution from the small tank, and by the heat of this solution to excite upward peristalsis to carry the tube farther. Once beyond the flexure, irrigate before proceeding.

At first the treatments were begun solely for cleansing the gut. As Schellberg followed certain cases, he found that he not only cleansed the gut, but where there was marked prolapse and displacement, even where the colon had been bound down by adhesions, persistence for a time freed the intestine, making it normally movable as well as relieving the sagging and ptosis. The correction of the sagging and ptosis was to be accomplished by a removal of the abnormal load of fecal matter and by the stimulation of the cleansing. The free-

ing of the gut from adhesions was not expected, but is forming one of the most gratifying results of this treatment.

The study of conditions within the abdomen on the operating table and from autopsies teaches that intestinal pockets are common in the colon, formed, as we know, when two inflamed surfaces lie close together in the lumen. The exudates from the inflamed surfaces coalesce, consolidate, and form a band of tissue which contracts, pulling the two points together, forming a pouch in the intestine, the blind sacs making perfect bacterial incubators. (To these exudates Schellberg has given the name intestinal interlining adhesions.) No cathartic or intestinal antiseptics given by mouth will clean these. Nor will the usual enemas remove the contents of such a pocket. The irritation caused by the bacterial growth in these pouches causes a reaction on the walls of the intestines, with the throwing out of a serous exudate which later becomes organized, forming the so-called adhesions, binding the colon to the abdominal walls or some intra-abdominal structure. As a result there is a colon which has not only lost its mobility, but has become an incubator for bacteria and a producer of toxic material. He found that by passing the tube over these pockets daily with the stretching of the colon, his solution loosened these interlining adhesions, which were expelled, and at times would break loose some of the external adhesions. Sometimes this happened during the treatment, causing the patient sharp pain. More frequently it came after the lavage. With the opening of the pocket and the removal of the irritating accumulation, the adhesion bands immobilize the organ, atrophy, and give way. He has seen misplaced immobile colons become mobile and resume their normal anatomical position after ten days of treatment. The parting of the binding adhesion may give the patient a sharp, stabbing pain, which is of short duration.

Schellberg has learned that until the colon is fairly sterile no lasting benefit is to be gained by the planting of the bacillus bulgaricus or the bacillus acidophilus. His

method is to wash the colon daily with the antiseptic solution until the smears show a low bacterial count in the gut. The desired sterile condition is achieved in ten days with the average case. Streptococcus and staphylococcus organisms must be reduced to the minimum before planting.

Not infrequently a case is met in which the antiseptic solution causes such an irritation that one must stop the irrigation before the desired cleanliness is obtained. Into these irritable colons Schellberg introduces a one-per-cent solution of dextrose, and a planting of twenty to thirty billion acidophilus and bulgaricus is made as high up in the gut as possible. After three or four of these daily plantings the intestine is usually quieted so that the disinfection can be resumed.

A few cases which had apparently been in condition for the permanent planting later showed increased or renewed streptococci and staphylococci after two weeks. In such he disregarded his plants and renewed the disinfection. With the acidophilus on the increase with the absence of streptococcus and staphylococcus organisms, a chance of recurrence is not great. With ordinary care and diet, patients have shown a vigorous growth of acidophilus two years after this treatment.

For planting, Schellberg uses four ounces of a one-per-cent dextrose solution, containing twenty to thirty billion acidophilus and bulgaricus, injecting this into the ascending colon or cecum. The temperature of this solution should be 50° C., a planting made daily for from four to seven days, and then every second day for four or five treatments. The patient is placed on the right side for the planting. Before injecting the plant, one should be sure that all the solution used to introduce the tube has been expelled and that peristaltic action has become quiet. Following rectal plant the patient should remain quiet, lying on the right side for thirty minutes after the planting. After colonic treatment is discontinued the patient is instructed to continue taking active liquid cultures of bacillus bulgaricus by the mouth.

Diagnosis and Treatment of Congenital Syphilis.

MARSHALL, in the *British Journal of Children's Diseases* for April-June, 1921, states that as a general rule it is advisable to treat the infant of a known syphilitic mother after birth, whether it has a negative or a positive Wassermann reaction, and whether it shows signs of congenital syphilis or not, for we know that the majority are born with no symptoms and are often negative, and that some may have visceral syphilis.

Here again it is best to give combined treatment with arsenic and mercury. Many practice intravenous injections of arsenic, using the veins of the scalp, the external jugular, or the dorsal veins of the foot. Some inject into the longitudinal sinus. Others obtain equally good results with intramuscular injections. Personally he prefers intramuscular injections made up with glucose, which diminishes the pain. Necrosis of the buttock, so often mentioned as an objection to this method, is in his opinion rather a bogey. He has never seen it, and Adams, who has used intramuscular injections of galyl and glucose for several years at the Thavies Inn Clinic for pregnant syphilitic women, has never had a case. Perhaps the cases of necrosis reported are due to too bulky injections, or possibly to the mixture with creocamph, which he has seen cause large and painful nodosities.

Mercury should be given simultaneously, either in the form of gray powder or inunction, and it is important to continue mercurial treatment for a year at least.

Late congenital syphilis should be treated with arsenic, mercury, or iodides, according to the conditions presenting themselves. As a rule, however, it reacts less favorably than acquired syphilis to salvarsan, and some conditions improve better under mercury and iodides.

We now come to the question of the treatment of the children of syphilitic parents in whom there are no definite signs of congenital syphilis and no history of such in infancy, but who are found to have a positive Wassermann reaction.

This is a somewhat similar problem to that of the treatment of a persistently positive Wassermann reaction in acquired syphilis and depends on the signification of the reaction. Most pathologists are of opinion that a positive Wassermann reaction always signifies the presence of active spirochetes, but Levaditi, one of the early pioneers in this subject, has suggested that it may be of the nature of an immunity reaction which may continue some time after cure.

Clinicians are divided on this question. Some advocate continued courses of intensive treatment with salvarsan with the object of getting a negative reaction; others hold that such treatment is unnecessary and detrimental to health.

Personally he thinks that such cases should be kept under observation and tested again later on, but he does not think that intensive treatment is indicated on the sole evidence of a persistently positive Wassermann reaction. There must be a limit to a patient's capacity for "606," and there is no limit to the amount indicated by some enthusiasts. As a matter of fact, the Wassermann reaction is too recent for this question to be decided, as it has been in general use little more than twelve years. We do not know how long the reaction may remain positive, nor do we yet know whether it is those cases with a persistently positive reaction which develop tabes, general paralysis, and other late manifestations.

But what we do know—at any rate those who are not in their first youth—is that a multitude of patients who were treated in the pre-Wassermann days (with mercury only) developed no further symptoms, married, and had healthy children. It is more than probable that many of these had a persistently positive reaction. It is very likely that the reaction has a tendency to become normal in course of time.

We also know: (1) That the reaction may remain positive in spite of prolonged treatment—for anything we know because of too much treatment; (2) that a positive reaction may become negative without further treatment.

Again, even if a positive reaction signifies

active spirochetes, a negative reaction does not exclude them. Warthin found evidence of active syphilis in the post-mortem examination of many patients who had given a negative Wassermann reaction during life.

It would therefore appear unwise to depend upon the sole evidence of the Wassermann test as a guide to treatment. This, and other tests, must be taken in conjunction with clinical experience, the cultivation of which has of late been somewhat neglected.

Since this article was written, Dr. Levaditi has informed Marshall that he has renounced his earlier idea, and believes that a positive reaction always signifies living spirochetes; but he admits that this is non-proven.

Infective Arthritis and Allied Conditions.

In the *British Medical Journal* of June 4, 1921, WILLCOX states, with reference to treatment, that the most important step is to first find out the cause of the infection which has given rise to the arthritis. The measures to be adopted are generally known. A careful and complete clinical examination should be made to find out any possible source of infection, and this should be supplemented by an x-ray examination of the teeth and bacteriological examination of the stools and urine.

In acute cases with pyrexia absolute rest in bed is essential and complete rest of the affected joints. Local applications of heat, such as electric light baths, or fomentations, iodine poultices, etc., are of value. Salicylates, which are of such striking benefit in rheumatic fever, are of little value. Indeed, drugs, except for the relief of pain—such as pyramidon and phenacetin—are not of much use. Intestinal antiseptics—such as guaiacol carbonate gr. x t.i.d., or cyllin min. iij—should be given. A new intestinal antiseptic, "dimol," which is said to have fifteen times the disinfecting power of phenol and to be non-toxic, may be given in doses of 2 to 4 grains in keratin capsules three times daily. Bier's treatment is of value until the exciting cause has been de-

termined; an elastic bandage is placed round the limb above the affected joint so as to obstruct the veins but not the arteries, and is left on for twenty minutes daily.

In cases without pyrexia, if there are signs of active inflammation in the joint, such as redness, heat, swelling, or pain, rest of the joint is essential, and local and general treatment as above should be prescribed. Iodine is of value. Collosol iodine in doses of 1 to 2 drachms with a wineglassful of water should be given twice daily. Iodides, if tolerated, may be given instead.

As soon as the source of infection is found this should be eradicated if possible. Where the teeth are implicated or an apical dental infection is found, the affected teeth should be removed and placed in a sterile vessel for bacteriological examination. A satisfactory way of dealing with an apical infection is Gardner's method of sterilizing the infected bone area by removal of the alveolar layer over the site of the lesion and curetting away the diseased tissue, and sterilization after removal of the offending tooth. This involves a cutting operation over the gum of the affected part.

The vaccine treatment is of great value, but it cannot be too strongly insisted upon that it must be accompanied by removal of the causal infection. Affected teeth should be removed, and a vaccine prepared after guarding against possible contamination of the teeth removed with normal streptococcal organism found in the mouth. A course of at least three months of vaccine treatment is usually required, with weekly and later fortnightly doses. It is a wise procedure to have a bacteriological examination of the feces made, even if a dental streptococcal infection has been found. Usually an abnormal streptococcal intestinal infection is also present in such cases. It is then an advantage to use for treatment a combined vaccine made with equal proportions of the dental and intestinal streptococci. In cases in which the teeth have been removed and arthritis still persists, an examination of the feces or colon washings will usually indicate a streptococcal infection, and in such cases vaccine treatment may give benefit.

In chronic and subacute cases electric light or radiant heat treatment should be given daily or on alternate days, and this should be immediately followed by ionization with iodine ions, a 2-per-cent solution of lithium iodide being placed on the lint of the cathode. In cases in which much pain is present ionization with salicylic acid ions is of value. Diathermy is of value in relief of pain.

When there are no signs of active inflammation and the infective cause has been removed, massage and movements of the joints are indicated. Where the joint movements are much limited in such cases breaking down of adhesions under an anesthetic or suitable surgical measures may be adopted.

In pyrexial cases the diet should be mainly liquid, but it must be borne in mind that most cases of non-specific infective arthritis require a diet of high nutritive value, and attention should be directed toward giving a dietary rich in vitamins. Milk, cream, eggs, the unheated juice of fresh lemons or oranges, fresh fruits and vegetables, fish, chicken, and meat, may be given according to the digestive capacity of the patient. If tolerated, milk fermented with lactic acid bacilli is of value in controlling intestinal fermentation. Cod-liver oil and malt, or one of the many substitutes for this now on the market, may also be given with advantage.

In cases of fibrositis of aponeuroses and tendons local electric light and massage gives the best results; diathermy and ionization are sometimes beneficial. In perineuritis, such as sciatica and brachial neuritis, frequent application of electric light gives the best results. Ionization is sometimes of value, and if there is much pain salicylate ions should be used instead of iodine. Iodine may be given internally, and aspirin, phenacetin, or pyramidon for relief of pain. The local application of a mixture of equal parts of chloral, menthol, and camphor, on gauze covered by oil silk, is very helpful. Complete rest during the acute stage is necessary. In bursitis and tenosynovitis, local treatment by electric

light and ionization is indicated. In chronic villous synovitis where the above measures fail, the opening of the joint surgically and removal of the villous outgrowths has given good results.

Where a case of early arthritis is subjected to investigation and treatment on the above lines, a complete cure can be effected. In cases of long standing the inflammatory changes are often progressive in nature, and removal of the primary cause may do little good because the infective process is being carried on by a secondary intestinal infection. In such cases everything possible should be done to remove both the primary and secondary causes of infection, and when the signs of active inflammation in the joints have ceased, measures should be taken to improve the mobility of the joints and muscular tone by massage and movements.

Chronic Lead Poisoning in the Printing Presses of Calcutta.

CAMPOS, in the *Indian Medical Gazette* for May, 1921, states that among printers in India lead is largely absorbed through the lungs as the presses are full of dust which is inhaled, especially as a result of dry sweeping, which is common in all the presses. An analysis, by Rueszagzi, of dust from type cases showed that it contains 57.7 mg. of lead, 186.8 mg. of antimony, and small quantities of arsenic. In this connection it must be mentioned that the metal of which the type is made consists of 75 per cent lead, 20 per cent antimony, and 5 per cent tin. The presence of antimony also suggests the possibility that some of the symptoms of typesetters may be due to antimony absorption going on for long-continued periods of time. It is also absorbed through the skin, though not so often through the unbroken skin as when there are erosions, which occur among printers as a result of using lye for cleaning the surface of the type. It is also certain that it is absorbed through the gastrointestinal tract, as betel chewed and food eaten in the presses is touched by soiled hands.

Besides, compositors have bad habits of holding the lead type in their mouths while setting or sorting it, and of moistening their fingers in their mouths in order to hold it better. Oliver reports that the water in which printers wash their hands was found by Van Eyk to contain from 6 to 15 mg. of lead per man. Lead is eliminated through the kidneys and the skin. Even when there are no symptoms of lead poisoning lead can be detected by chemical tests in the urine of the printers. It must be mentioned in this connection that albuminuria and nephritis are very common among printers.

His observations, though not very exhaustive ones, are sufficient to prove that in the presses of Calcutta there are and have been many cases of chronic lead poisoning. It is true the anemias in some cases may be due to malaria from which the printers commonly suffer, and constipation is such a general complaint that it cannot be attributed to lead alone. But the colic, the blue line on the gums, the history of cases of lead paralysis and the changes in red blood-corpuscles are enough to warrant his conclusions.

It is clear from the cases observed that in better ventilated presses and wherever some cleanliness is observed there is less absorption of lead. Susceptibility is remarkably variable. An old man in press No. 2 after working for forty years has less evidence of lead poisoning than a young man in press No. 1, who after working for six years only developed a blue line on the gums and suffers from colic, constipation, and diarrhea. The difference in these two cases may be really due to the one observing the hygienic principles in the work-room and in the house better than the other. One fact which vitiates the statistical data is that as soon as printers begin to have neuritic pains in the hands or the legs they leave work and are heard of no more. This is the reason why more cases of lead paralysis are not found in the presses. Probably they pass to the hands of a village doctor or a Kaviraj for treatment, while the causal relation between his former occupation and his disease is forgotten.

The Treatment of Erysipelas.

PORTER, in the *Indian Medical Gazette* for June, 1921, states that he has lately seen rather striking results obtained in the treatment of this disease by the use of carbolic acid, and, as it may not be generally known, he desires to bring it to the attention of the readers of that journal. The treatment consists in painting the entire surface of the involved area with 95-per-cent-pure carbolic acid on a cotton-wool swab and extending half an inch into apparently healthy skin.

It is left on until the purplish area of the inflamed skin is replaced by a pretty complete whitening of the skin, which must be waited for.

The whitening must not be allowed to proceed to complete blanching, and when large areas are involved, only a portion must be painted at one time.

The second step consists in going over the blanched area with swabs saturated with methylated spirit.

If thoroughly done, the whitened area again becomes pink, and the alcohol must be laid on until this is accomplished. Afterward, other areas should be attacked in the same way until the whole operation is completed in one sitting. The subsequent management consists in the application of moist dressing—simple saline or 1-in-20,000 bichloride of mercury.

His first case was an old lady in whom the disease had affected one thigh and leg to a considerable extent. The second was a case of facial erysipelas. Both had been given full doses of antistreptococcic serum before he saw them, but the disease was still spreading. In the second case he gave two intravenous injections of liquor iodi xx minims at 24 hours' interval. This was equal to 1 grain of solid iodine, and recovery was very rapid.

In both cases the spread of the inflammation stopped at once after the application of the carbolic acid.

The usual dietetic and remedial measures were, of course, employed in each case.

The importance of attacking the spread-

ing edge of the inflammation has, of course, been known for many years, and various remedies, such as nitrate of silver, tincture of iodine and tincture of ferric chloride, have been used. Porter asserts that none of these remedies have anything like the potent and rapid effect which is produced by carbolic acid, used in the way he has above described.

Treatment of Hemorrhoids by Electrolysis.

SIGMOND, in the *American Journal of Electrotherapeutics and Radiology* for June, 1921, states that if the operator has a good galvanic outfit and understands the polarity effect he can get excellent results, does not confine his patient to bed, does not run the chance of an infection, and does not expose his patient to the dangers of an anesthetic.

In order to secure the desired results the action of the two poles must ever be borne in mind. Electricity is a dependable agent, acting in its various forms according to well-known laws which must govern its uses. The special properties of each pole are physical and therapeutic. Each is the opposite of the other. Thus at the positive, oxygen is produced; at the negative, hydrogen. The positive produces an acid condition; the negative, an alkaline. Positive is a vasoconstrictor and stops bleeding, while the negative is a vasodilator and favors it. The positive is a drier of tissue and hardens it, while the negative produces moisture and softens it. The positive exerts a sedative influence, while negative irritates it. The positive coagulates the albumin of the blood, while the negative liquefies and disintegrates organized structures.

There are several methods of treating hemorrhoids electrically, and all of them have their advocates. On the one hand, all methods are condemned by those whose experience with them has not been satisfactory. He has tried several methods, but prefers the positive pole, using the needle. The preparation of the needle is as follows: (1) Take an ordinary cambric needle and

insulate it by winding silk thread around it from one-fourth inch from the eye to within one-fourth inch of the point. (2) Stick the point of the needle into a cork for about one-eighth of an inch, thus leaving one-eighth of an inch above the cork. (3) Shellac the needle from the upper end of the thread down to the cork, thus leaving the part above the thread unshellacked and uninsulated to fit into the needle holder. The part in the cork is also uninsulated. After the shellac has thoroughly dried, remove the needle from the cork and it is ready for use.

For local anesthesia use quinine and urea hydrochloride or novocaine. Inject the pile and wait a few minutes for the anesthetic to take effect. The negative pole is attached to a large moist pad and strapped to the abdomen so as to make and keep good contact, thus assuring one of a steady current, because if the current breaks it is uncomfortable to the patient. Attach the positive pole to the needle and insert the needle in the pile. Insert it into the top of the pile, carrying it up to the thread; thus your uninsulated point is in the pile. The idea of the thread is to make a shoulder to prevent your inserting the needle too deep, and by using the thread for a guide you can always know that you are just in deep enough and not beyond where you want to stop. The shellacked insulation is in the wall of the pile, and the current then goes into the pile. Use about ten or fifteen milliamperes until the pile gets a decided blanching or ashy appearance. Puncture the pile as near the top as possible, because if one gets too close to the base, after-pain develops.

For about two days one will notice no decided change in the patient, but on about the third day one will see a smile of satisfaction. Always warn the patient that it will be a day or so before he can expect much of a change, and he will not be disappointed at not getting immediate relief.

Treat each pile separately, using a new needle for each pile, because the positive pole causes the needle to roughen, deteriorate

rate, and thus it will break off when used the second time. A good way is to treat one pile at a sitting; however, some treat all of the piles at one time. This Sigmond believes causes too much strain on the patient; whereas by treating one pile at a visit he notices no inconvenience.

It is necessary to have an assistant, as some one is needed to hold the speculum while the operator guides the needle with one hand and turns on the current with the other.

There are various specula on the market that can be used to bring the pile into view, so one can use the instrument to which he is most accustomed.

It must be remembered that this treatment is not a panacea for all rectal troubles, but for all internal piles that are not of the fibrous variety one can assure the patient of a cure.

The Basis of a Scientific Therapy.

Writing in the *British Medical Journal* of June 4, 1921, MACKENZIE states that a matter which strikes every one who gives it attention is the curious difference between theoretical and practical therapy.

We have the experimental pharmacologist demonstrating to the student with precision the effects of remedies by animal experiment. The student as soon as he enters the wards of the hospital finds a different atmosphere—drugs are administered without any reference to their experimental effects, and he finds the knowledge he has acquired in his pharmacological course of no use.

The pharmacologist scoffs at the clinician as unscientific and as employing empirical methods. The clinician replies that the laboratory teaching is academic and unpractical.

Mackenzie stated that the action of digitalis on the human heart is not understood, and when he made the observations on the effects of digitalis during his inquiry into mitral stenosis, he was struck by the variety of results obtained. In one patient digitalis would produce dropping out of beats due

to heart-block; in another it would cause the whole heart to stand still for two or three seconds, and then the ventricle would start off by itself; in another great slowing would result; and so on. When he looked at these patients individually, he found they all suffered from damaged hearts, but there were differences in the kind of damage, and he therefore formulated the theory that the action of digitalis is modified by the nature of the disease. It is manifest that the pharmacologist could never find this out, and his results were different, therefore, from that of the clinician. On the other hand, the knowledge of heart irregularities has been so defective that the clinical observer could not recognize them, but saw that they were different from the description given by the laboratory observer. That is the reason of the failure of the pharmacologist to explain the action of digitalis on the human heart, and the reason why the clinician could not recognize it.

This idea, at first dimly perceived, holds out the possibility of directing therapeutical research on lines based upon sound principles. One of the least creditable fields of knowledge is the therapeutic. While many drugs are usually employed, it must be confessed that our knowledge of the action of remedies is sadly lacking in accuracy. To this defect must be attributed that wide diversity of opinion as to the action of the simpler remedies and that confusion which bewilders the student.

Their inquiry into the nature of symptoms led the staff at St. Andrews to recognize that a great mass of symptoms is due to disturbances of normal reflexes. When a man falls ill, due, say, to the invasion of his body by a microbe, the toxins of this microbe produce the ill health by upsetting the normal reflexes, and we recognize these disturbances as the signs of disease.

The administration of a drug such as atropine acts in the same way by disturbing certain reflexes. Indeed, the effect of atropine may be described as an imitation disease. One of its effects is to paralyze the peripheral ends of the vagus and cause an increase in the heart-rate. If digitalis

is given it is without effect, because digitalis stimulates the vagus, and under atropine it is paralyzed.

In certain infections the heart-rate is increased because the toxins act like atropine, and digitalis does not slow the heart because the vagus is paralyzed, and that is the reason why digitalis does not slow the heart in a great many febrile and other conditions.

In auricular fibrillation the increased pulse-rate is due to a totally different mechanism. Here the ventricles are stimulated to increased rate by a shower of stimuli from the fibrillating auricle. The vagus is unaffected, and so the digitalis, when given, acts as we have seen on the bundle which conveys the stimulus from auricle to ventricle, and it is probably in this way that digitalis is so effective in slowing the heart-rate in auricular fibrillation.

Hemorrhoids and Anal Fissures, with Special Reference to the Desiccation Method of Treatment.

CLARK, in the *American Journal of Electrotherapeutics and Radiology* for June, 1921, states that the term "desiccation" is descriptive of the effect produced upon the tissues by heat generated by means of the high-frequency current, which is regulated so that the intensity is less than that of the actual cautery. The method of heat production differs from that of the actual cautery inasmuch as the heat is generated in the tissues by the resistance offered to the current, and has greater penetrating properties than the cautery as ordinarily used. The heat from the actual cautery is transmitted by contact with the tissues and is comparatively superficial in action. The desiccation method is one by means of which any accessible neoplastic tissue may be devitalized by heat of just sufficient intensity to desiccate it. Any standard high-frequency machine generating sufficient current can be used for this purpose and the technique easily learned with a little practice. A monopolar current of the Oudin type is employed. This is applied

to the lesion by means of a needle held in a suitable insulated handle and connected by means of an insulated wire to the high-frequency apparatus. The current strength to destroy growths of different sizes must be estimated. When the hemorrhoids are small the current is delivered through a short air space between the needle and the hemorrhoid; when of medium size the needle is brought in contact; and when large the needle is inserted into the hemorrhoid. No infallible rule can be given for the application of the desiccation method, for good technique must be acquired by practice.

The technique of infiltrating the sphincter muscle with a 2-per-cent solution of novocaine and adrenalin is simple, and consists of plunging the hypodermic needle at right angles and injecting 2 or 3 Cc. of the anesthetic deeply into the muscle about one inch from the anus. About five equidistant injections around the anus are sufficient to block the sensory nerves and render complete stretching of the sphincter possible. Care should be taken not to inject the novocaine subcutaneously, else the patient may suffer after-discomfort owing to resulting edema of the parts.

The slight postoperative discomfort is explained by the fact that the trauma to the tissues is slight as compared with the cautery, excision and ligature operations. Danger of stenosis is avoided because a contracted cicatrix does not result after the proper application of the desiccation method, since from a pathological standpoint contracted scar tissue is in proportion to the amount of trauma and secondary inflammation, and, as before stated, the trauma to the tissues produced by the desiccation current is comparatively slight.

Embolism is avoided because the dilated hemorrhoidal veins are completely destroyed and no chance is given for clotting. Secondary hemorrhage is avoided for the reason that the desiccating current penetrates for a short distance below the blades of the clamp, firmly sealing the vessels. This is not the case with the ordinary cautery, which seals the tissues superficially.

The desiccation treatment of external

hemorrhoids and hypertrophic tabs of tissue around the anus is simple and satisfactory. After local anesthetization a line is desiccated across the hemorrhoid instead of a primary incision with a scalpel. The needle is then inserted into the clot which is desiccated and the vein destroyed. The hemorrhoid is then incised through the desiccated line without hemorrhage and the desiccated clot curetted out. Relief is immediate and healing is rapid. Loose hypertrophic tabs around the anus are desiccated and allowed to slough, or they may be excised after the desiccation without hemorrhage.

The desiccation method for the radical treatment of internal hemorrhoids, no matter how extensive they may be, whether with sessile or pedunculated bases, has been found to be most satisfactory. This is true also of papillomata and other benign growths of the rectum and of urethral caruncles in the female. The usual preoperative preparation of the patient is carried out. Local anesthetization is usually employed by the method indicated, though in some supersensitive individuals a general anesthetic may be used. After stretching the sphincter each hemorrhoid is pulled down in turn by means of tenacula and the pile clamped at its base in the direction of the muscle fibers which are at right angles with the anus. The postoperative discomfort is so slight that frequently patients proceed with their duties of life immediately after the operation, but this is not usually advised if the case is a bad one, as it is best for such patients to remain in bed for a few days. The bowels should be opened the second day with a saline, and mineral oil used for about ten days thereafter.

In cases of anal fissure after the usual preoperative preparation of the patient and local anesthetization by the method indicated, the sphincter muscle is stretched, if the fissure is in the grasp of the muscle or above the muscle. If below the muscle, this stretching is not necessary. The fissure, which is always infected, is thoroughly desiccated, then curetted. The base is then superficially desiccated again. The diseased

membrane is by this means thoroughly destroyed and the whole tract sterilized. Reinfection has never been observed, healing is rapid, and a complete cure results.

So many excellent results have been observed that the desiccation method is recommended as a simple yet most efficient method for the radical treatment of the most severe cases of hemorrhoids and anal fissures.

Treatment of Malarial Fever in Individuals Susceptible to Attacks of Black-water Fever by Intravenous Injection of an Antihemolytic Quinine Solution.

BRAHMACHARI, in the *Indian Medical Gazette* for June, 1921, states that the hemolytic properties of a quinine salt are diminished by the addition of 10-per-cent glucose to the solution of the quinine salt in normal saline.

Quinine alkaloid has very little hemolytic properties, and this author believes that he has proved that a non-hemolytic quinine solution should not contain a quinine salt but the alkaloid itself.

He tried to prepare various solutions of quinine alkaloid without the aid of any acids, and after a very extensive series of experiments he found that the following solution of alkaloidal quinine possesses very marked antihemolytic properties. (It is to be recalled that quinine alkaloid is very slightly soluble in water.)

- (1) Quinine alkaloid, 5 grains.
- (2) Alcohol, 50 minims.
- (3) Urethane, 3 grains.
- (4) Calcium chloride, 7.5 grains.
- (5) Glucose, 300 grains.
- (6) Normal saline, 200 Cc. (.85-per-cent solution of NaCl in distilled water).

The above will give a solution of alkaloidal quinine of the strength of 1 in 600 in normal saline + 10-per-cent glucose.

The following observations show that the above solution is non-hemolytic, while a solution of quinine bihydrochloride containing the same strength of quinine radicle is hemolytic.

(1) 5 Cc. of the solution + 1 Cc. of 5-per-cent suspension of erythrocytes = no hemolysis occurs.

(2) 5 Cc. of a solution of quinine bihydrochloride having the same strength of quinine as in the above + 1 Cc. of 5-per-cent suspension of erythrocytes causes hemolysis.

Quinine alkaloid given by the mouth is converted into a salt with hydrochloric acid or bile acids before absorption, and since the quinine salts possess more or less hemolytic properties its oral administration to individuals susceptible to attacks of blackwater fever is objectionable. He considers such individuals should always be treated with the above antihemolytic quinine solution given intravenously.

This solution of quinine alkaloid is alkaline in reaction and is very well borne by malarial patients. If its antihemolytic properties are also exhibited *in vivo*, then he considers that one of the most difficult and vexed problems in malariology will be solved, and many valuable lives may be saved which will otherwise be lost because quinine salts cannot be administered to them on account of their susceptibility to attacks of blackwater fever or because such individuals may develop hemoglobinuria after their administration. He has observed that solutions of salts of quinine lose, to some extent, their hemolytic properties when they contain 10-per-cent glucose and 25-per-cent CaCl, but of all the quinine preparations the above solution of alkaloidal quinine possesses most marked antihemolytic properties.

It is generally stated that in a case of blackwater fever quinine should not be administered if malarial parasites are not found in the blood. But it has to be remembered that the parasites may disappear from the peripheral circulation after administration of a small dose of quinine and be still present in the internal organs. Therefore the problem whether quinine should be stopped or not cannot be determined by the absence of parasites in the peripheral circulation. If, however, the above antihemolytic quinine solution is administered, then the contraindications to the adminis-

tration of quinine are removed even when blackwater has appeared.

As stated before, the above solution is well borne by malarial patients, and Brahmachari has found that given intravenously it does not lead to such profound fall of systolic blood-pressure as is observed in the case of quinine bihydrochloride. He has sometimes even found that there is a tendency toward a rise of systolic blood-pressure. Frequently there is a rise of diastolic blood-pressure similar to what is observed in the case of quinine bihydrochloride. On the whole, as far as his present observation goes, he has found that circulatory disturbances are less marked in the case of this solution given intravenously than in the case of quinine bihydrochloride dissolved in normal saline.

In order to test whether the hypertonicity of the above solution may lead to any other untoward results, he has found that given intravenously into rabbits it did not give rise to any such effects; 10 Cc. of the solution (= $\frac{1}{4}$ grain of the quinine alkaloid) given intravenously into rabbits weighing 450 to 470 grammes did not produce any ill effect. This will correspond nearly to giving 1200 Cc. of the solution to a man of average weight.

The Colon and Colitis.

LORD DAWSON of Penn, in the *British Medical Journal* of July 9, 1921, states that owing to the complexity of its origin and the variety of its manifestations, mucous colitis is difficult to treat. The coarse food rich in cellulose advocated by Von Noorden is not a success. It irritates the intestine, and is prone to produce gas.

The food should consist of light solids—for example, white fish, first cooked meats, dishes made with eggs, light puddings, etc. Soups should be taken sparingly or avoided. Only a little fluid should be taken with the meals, but sufficient between meals. Fruit and vegetables are a problem; they are often difficult to digest, yet from the point of view of nutrition are desirable; mashed potato,

cauliflower, and cooked celery and lettuce agree; and of fruits, apple is the safest.

In intractable cases the limitation of vegetables and fruit has often to be strict, and by some authorities a paste (macaroni) diet is prescribed for a period. The disadvantage of a too restricted diet is twofold—it discourages the patient and is apt to result in an insufficiency of essential food-stuffs and vitamins. The latter may be given separately where foods containing them cannot be tolerated in adequate quantity. Sometimes fruit and even raw vegetable like lettuce can be tolerated if taken alone, whereas they remain undigested if mixed with other food. And generally colitis patients do better by taking only two main articles of food (courses) at a meal.

It is important for the extremities to be warm, and especially before eating.

If the body or mind has been engaged in effort, a few moments of repose and relaxation should precede the taking of food. It will often be found that these patients cannot take vigorous exercise of both body and mind on the same day. A business man is often better with only gentle exercise during the week, reserving his physical exertion for the week-end. Where the patient's abdomen is over-responsive the treatment advised should have regard to that fact. Fatigue, stress, and anxiety must be guarded against where possible. Periodic rests, such as a weekly or fortnightly day in bed, help to secure this end.

A great deal can be done by educating the mind not only to concentrate but to detach and relax quickly. This is an important aspect of treatment. Physical culture holds an established position. Surely psychical culture is of like importance. The power to rest quickly and relax deliberately is essential to those who feel acutely and work strenuously.

Drugs that aid digestion, like taka-diastase and pancreatin, do good. Sleep is apt to be disturbed by distentions of the hollow viscera. Bismuth and sodium bicarbonate with a carminative, and if necessary a few minims of nepenthe, given at bedtime will help this condition.

Aperients should be gentle, and for clear-

ing the bowel castor oil is the best. Very often little aperient is needed if paraffin is taken regularly, though there are patients in whom paraffin is ejected alone and even incontinently. Special care in the use of aperients is needed when bacilluria exists.

An essential indication is to secure the emptying and cleanness of the colon. This is secured by intestinal lavage. Bismuth in bulk (3ij) administered in bread and milk or jelly taken every week or ten days is often of benefit. It seems to act by scouring the colon. Where there is much fermentation an ounce of wood charcoal may be mixed with the bismuth. Intestinal antiseptics are disappointing.

Where the above measures fail to secure evacuation and cleansing of the intestine, appendicostomy is a sound and safe procedure, and is often productive of considerable benefit.

Sufficient experience has now been gained to pass the operation of colectomy under review.

The results as a whole have not been encouraging. Apart from its magnitude and, therefore, risk, the operation seldom restores to a patient anything approaching a normal life. Patients will express doubts as to whether they have gained enough to have made the operation worth while.

Lord Dawson quotes cases to show that technical and clinical success do not always go together. Further, there are not a few instances in which the operation completely fails in its objects and leaves the patient as wrecked, if not more wrecked, in health than before.

Now and again the results are excellent and succeed where previous measures have failed. He has under observation a case in which a transformation was effected by colectomy, and now, after ten years, the patient continues in good health.

The indications for colectomy would seem to be:

1. Where the motility of the colon is so spent that all other measures fail to prevent stasis within it.
2. Where the colon is so damaged in its defences that, in spite of every effort to keep it cleansed, toxic products get through

in such abundance as to ruin the health of the patient. But here, too, there is risk that the second line of defence in the liver may be damaged also.

Hemicolectomy is on a different footing. The operative risk is small, and if it fails in its object there is little risk of the patient's condition being made worse. If the failure of function is in the proximal colon the prospect of success should be good, especially if the ileocolic valve is preserved in the implanted portion, as has recently been done. Unfortunately, however, there is sometimes too much mischief in the distal colon for the operation to be adequate. When such is the case and a complete colectomy appears to be inevitable, he suggests that it is worth while considering in each case whether colotomy would not be efficient and preferable. The thought of colotomy is, no doubt, in discord with a fine surgical sense, and its performance carries a feeling of disappointment to the surgeon that circumstances do not permit him to do something better. But in relation to this particular problem it has advantages. It is a simple operation, patients achieve a considerable accommodation to its inconveniences, and, if it fails, further surgical procedures are not precluded.

On the other hand, complete colectomy is the last and irretrievable word; it offers but a modest prospect of success, and its failures, not a few in number, are sometimes apt to be such dire failures as to mean for the patients misery and suffering little capable of alleviation.

The Mode of Action of Low Temperatures and of Cold Baths in Increasing the Oxidative Processes.

BURGE and LEICHSENRING, in the *American Journal of Physiology* for July, 1921, state that low temperatures and cold baths produce an increase in the blood catalase of warm-blooded animals and a decrease in cold-blooded animals, in keeping with the fact that cold increases oxidation in warm-blooded animals and decreases it in cold-blooded animals. An increase in the

external temperature increases the blood catalase in cold-blooded animals in keeping with the fact that it increases the oxidative processes.

The stimulating effect of low temperatures on catalase production in warm-blooded animals decreases with a rise in temperature, disappearing at room temperature (22°C.), in keeping with the fact that the stimulating effect of cold on metabolism decreases with a rise in temperature. Baths at 35°C. produce no increase in oxidation in warm-blooded animals, and it is shown in this paper that such baths do not increase catalase.

The increase in oxidation in warm-blooded animals on exposure to cold is attributed to an increase in catalase, and the decrease in oxidation in cold-blooded animals on exposure to cold to a decrease in catalase. The increase in oxidation in cold-blooded animals occurring with a rise in external temperature is attributed to an increase in catalase.

Lung Mapping by the Injection of Bismuth Mixtures in the Living.

LYNAH, in the *New York Medical Journal* of July 20, 1921, in summarizing his article on this subject, states that bismuth mixtures can be injected into the bronchi and lung of the living without doing harm.

The injection of opaque substances into the lung of the living will open up an enormous field of usefulness in the study of cough, the expulsion of secretions from the lung, and lung drainage. It will also localize bronchial strictures in the same manner as seen in the esophagus. Furthermore, it will be of the greatest aid to the thoracic surgeon by mapping out the abscess cavity in the correct lobe of the lung on which he is to operate.

A definite lung abscess cavity is seldom seen bronchoscopically. Pus is usually seen coming from a small branch bronchus, and the abscess cavity may be well around a corner and not in a direct line with the bronchus from which the pus is oozing. An injection of a bismuth mixture or some

other opaque substance will clear up this error.

Bismuth when it enters the abscess cavity is interpreted in the radiographic plate by its metallic luster, and when it is in the lobular lung structure it is interpreted by its dull opacity. Pus diffuses and soaks the lung structure, and this often makes the involved area appear many times larger than it really is.

The amount of bismuth injected in these patients was an 8-Cc. mixture of bismuth subcarbonate in pure olive oil, one in two and one in three. The mixture is made sterile by boiling before injection.

The injection should be made slowly and not with a squirt, for the picture may be spoiled by bismuth lung soaking.

From these preliminary studies it seems that cough and the action of cilia may not be the only means of expelling secretion from the lung.

While bismuth mixtures were originally injected by him for purposes of lung mapping of abscess cavities in their proper lobes, it seems to have been of benefit to the two patients in whom it was tried. So far it has done no harm.

Experimental Studies of the Pharmacology of Quinidine.

The *Medical Record* of July 23, 1921, in abstracting the paper by Cohn and Levy on this subject read before the Association of American Physicians recently, states that they quoted one patient who said that his cardiac attacks (auricular fibrillation) were stopped by taking quinine. It was tried on other patients, with success in some cases. Other derivatives of the drug were studied in order to stop fibrillation. Quinidine gave success in 50 per cent of cases. Experimental studies on dogs showed that contraction of the auricle became less, and that with faradization after quinidine dosage one could not start fibrillation. Other effects noted were increase of height of contraction and fall of blood-pressure in the peripheral arteries. There were no con-

stant results on the T-wave or on the conduction time. The conclusions were that there seemed to be an alteration in the muscle which made it refractory to faradization as regards fibrillation, and there was a striking effect on contraction. These are artificial experiments, not likely to be carried into the clinic. Experiments are now being made as to the effect of the drug on the fibrillatory process.

Dr. Cohn, in closing the discussion on his paper, said that the dose of this drug clinically was one of 0.2 to 0.4 gramme, to test for drug idiosyncrasy, and then administration at half-hour intervals of 0.4 gramme doses by mouth, and usually the effect had been obtained by a total dosage of 1.2 grammes.

The Deleterious Effects of the Bromide Treatment in the Diseases of the Nervous System.

HUNT, in the *Medical Record* of July 16, 1921, states that the symptoms of bromidism are twofold: (1) Physical, and (2) mental.

1. The physical symptoms are the rash, the coated tongue, and fetid breath; constipation, cachexia, feebleness, and excessive flow of saliva; and, if the condition is aggravated, an ataxic gait, a loss of patellar reflexes, tremor, and an ataxic speech.

2. The mental symptoms are restlessness, insomnia, depression, later excitability, confusion, delusions, and hallucinations.

The conclusions to be reached from this little study are:

1. That bromides are very far from harmless.

2. That their prolonged administration will give rise to both physical and mental symptoms, the latter a condition akin to paresis.

3. That they tend to aggravate the irritability and mental deterioration in long-standing cases of epilepsy.

4. That toxic cases develop more rapidly upon the administration of bromide.

5. That circulatory, traumatic, and arterial cases are peculiarly susceptible to their administration.

6. That bromide may mask the symptoms of mental disease just as thoroughly as does opium in surgical conditions.

7. That mental and alcoholic cases are peculiarly susceptible to bromidism.

A Valuable Method of Treatment in Selected Cases of Syphilis.

GUY, in the *American Journal of Syphilis* for July, 1921, states that syphilis should not be treated by rule of thumb. Generalization will lead to disaster. One must treat a patient as well as a disease. Certain cases will not tolerate intensive treatment, and there are those in which a more conservative therapy is not effective. Treatment should be individualized, at the same time holding as closely as possible to certain fundamental principles. Treatment must be long continued—on that point every one is agreed—the only exception being in early primary cases in which one may abort the infection by intensive therapy. The fact that nearly all syphilographers treat primary syphilis intensively strengthens his personal opinion that this should be the method of choice, regardless of the stage of the disease, provided the patient is physically fit. We are dealing with a constitutional infection in which a cure is obtained only when every spirochete has been destroyed. In late syphilis inaccessibility of the organism, either in tissues with poor circulation or in masses of comparatively avascular granulomatous infiltration, makes a therapeutic victory more difficult. With iodides to act as resolvents of infiltrations it seems logical to believe, as pointed out by Pollitzer, advocating administration of arsphenamine daily for three days instead of less frequent injections, that the hidden spirochete will much more likely receive a lethal dose of arsenic if the blood stream is kept continuously saturated with the drug as long as is compatible with safety.

That the method is not particularly dangerous is attested by the fact that many hundreds of injections have been given successfully in this way. The plan is based on the idea that arsphenamine acts as a

direct spirocheticide; if such is the case, the method is sound; if the drug acts indirectly as a tonic, gradually building up to overcome the infection, then it is wrong. Pollitzer and those others who have used the method have seen a positive Wassermann, persisting under less intensive therapy, promptly reversed. Pollitzer gives arsphenamine on each of three successive days, and follows this with a course of mercury, after which he institutes a therapeutic rest. In selected cases he has used the following modification with gratifying results. He gives 0.1 gm. arsphenamine for each 30 pounds of body weight on each of three successive days. This is repeated after one month, and again after the same interval. In selected primary cases he occasionally gives the second three injections of arsphenamine after an interval of two weeks. His patients are also kept saturated with mercury during this same period, either soluble or insoluble salts being used intramuscularly, dosage being estimated according to the tolerance of the individual. Thus, using, for example, the salicylate of mercury, a course would be recorded approximately as follows:

Male—weight 150 pounds.

Jan. 1—Arsphenamine, 5 gm.
 Jan. 2—Arsphenamine, 5 gm.
 Jan. 3—Arsphenamine, 5 gm.
 Jan. 6—Hg. salicylate, 1 gr.
 Jan. 13—Hg. sal. gr. 1.
 Jan. 20—Hg. sal. gr. 1½.
 Jan. 27—Hg. sal. gr. 1½.
 Feb. 1—Arsphenamine, 5 gm.
 Feb. 2 " "
 Feb. 3 " "
 Feb. 6—Hg. sal. gr. 1½.
 Feb. 13—Hg. sal. gr. 1½.
 Feb. 20—Hg. sal. gr. 1½.
 Feb. 27—Hg. sal. gr. 1½.
 March 3—Arsphenamine, 5 gm.
 March 4 " "
 March 5 " "
 March 8—Hg. sal. gr. 1½.
 March 15—Hg. sal. gr. 1½.
 March 22—Hg. sal. gr. 1½.
 March 28—Hg. sal. gr. 2.

Upon completion of the course a therapeutic rest of approximately eight weeks is given, after which rest the course is repeated except in those cases in which the dark field is positive, and the Wassermann reaction negative. In addition to avoiding the development of an arsenic and mercury fast

strain of spirochete, one allows time for recuperation from the intensive treatment, and further is able to obtain a serological check just before beginning the next course that more nearly represents the condition of the blood than one obtained while the patient is on active medication. Three such courses are given in the average case, the amount of medication obviously being varied in different individuals. Also it is occasionally necessary even in selected cases to materially modify the plan. Progressive loss of weight, anemia, evidence of renal

irritation, etc., are examples of such indications. In a few cases he has used continuous medication, alternating with mercury and arsphenamine, and his rather limited experience with this modification leads him to favor the plan of intermittent therapy. He has given approaching 500 injections of arsphenamine by this method (daily for three days) without serious trouble. It is essential that the technique used shall conform to known standards, and that the patient be a young vigorous adult in first-class physical condition.

Surgical and Genito-Urinary Therapeutics

Reconstruction Operation of Ununited Fracture of the Neck of the Femur.

WHITMAN (*Surgery, Gynecology and Obstetrics*, June, 1921) observes that the results of fractures in general are determined primarily by the efficiency of the treatment in correcting deformity and in apposing displaced fragments; and that the greater the obstacles to repair, whether mechanical or nutritive, the more directly is success dependent upon favorable opportunity. It follows, therefore, that the exceptionally bad results that distinguish fracture of the neck of the femur from all the other injuries of its class are due primarily to the inadequacy of conventional treatment to assure the essentials of functional repair.

Non-union, which is the rule, if the fracture is of the central type, is caused primarily by separation of the fragments. These are of small area lying in a lateral relation to one another. They can be apposed therefore only by placing the limb in the attitude of full abduction, because the fragments are thus brought end to end, so that security may be maintained by mutual pressure. Accurate adjustment and secure fixation are in this instance essential to repair, because it must proceed from the interior unaided by external callus.

In fractures at the base of the neck, the larger area of the fragments and the better blood supply favor repair.

At the hip the range of motion is determined by the angle of the neck of the femur. If the angle is lessened, abduction is correspondingly restricted by contact of the upper border of the neck with the rim of the acetabulum, or if the neck is materially shortened, by impact of the trochanter at this point. If its forward inclination is lost, the limb is rotated outward and the range of flexion is restricted.

Depression and backward distortion of the neck (coxa vara) is the characteristic primary and persistent deformity of the "extracapsular" fracture, since it is rarely corrected by design or incidentally by treatment. This deformity causes direct and apparent shortening of the limb; for since the range of abduction is insufficient for functional requirements, it is supplemented by a tilting upward of the pelvis on the affected side.

Repair of fractures in this region is very slow, and because of its projection from the shaft the neck of the femur is subjected to greater strain than are other bones. Furthermore the joint is often involved in a form of sympathetic arthritis, as indicated by sensitiveness to weight-bearing, to

passive movements, and by restriction of voluntary motion by what is called muscular spasm, the most significant indication of instability of repair.

If functional use, particularly weight-bearing, is permitted before the fracture is consolidated, the primary deformity may be increased as in the progressive stage of coxa vara, or it may induce excessive callus formation without or nutritive changes within the joint. Furthermore, whenever the injured part is unequal to the strain put upon it, the limb instinctively assumes the attitude of protection, namely, adduction and flexion, and muscular contraction and shortening increase and confirm the distortion.

Lack of protection, which is characteristic of conventional practice, is therefore one of the important factors of what is now considered inevitable disability.

Ununited fractures fall below the standard of the average disability. In most instances crutches are required in locomotion. There is usually discomfort on changing from rest to activity, and often severe pain at night, caused apparently by friction or interlocking of the fragments. Occasionally the capsule or the fibrous union or the interlocked fragments may be sufficiently resistant to assure stability, but there is usually a tendency to further displacement with consequent increase of functional disability. As a rule the discomfort is the greatest in the cases in which the fragments are fairly apposed, thus offering an opportunity for friction; the disability is most marked when they are widely separated by upward displacement of the shaft upon the pelvis with consequent distortion of the limb.

Operative treatment offers the only prospect of definite relief, but thus far it has been practically limited to attempts to secure direct union of the fragments. In this operation the essentials of success are that the neck be long enough to permit a sufficient range of abduction, and that on removal of the fibrous tissue the surface of each fragment shall bleed freely. Under these conditions, if they are accurately

apposed by abducting the limb to the proper degree and fixed by a bone peg, union is fairly certain, indicating that if the abduction method, the only efficient means of treating this fracture, had been applied originally the secondary operation would have been unnecessary.

In a large proportion of the cases this treatment is impracticable because the patients are not seen until long after the injury—when the neck fragment has practically disappeared and when the circulation has been greatly reduced by the atrophy of disuse. Furthermore the treatment must be adapted to the individual as well as to the local condition. The majority of the patients are elderly subjects who are often mentally as well as physically depressed by a painful disability of long standing. If an operation is to be undertaken, they desire above all the assurance of relief from discomfort, and restoration of weight-bearing capacity in a definite time. The limb is atrophied, the circulation is poor, and the joints often stiffened from disuse—secondary repair is a very slow process; the outcome is uncertain and the functional result imperfect because of the degenerative changes involving the components of the joints.

In the great majority of cases direct union is doubtful, and thus far the alternatives have been to remove the head of the femur and either to implant the upper extremity of the shaft in the acetabulum, or to cut through the trochanter and force it outward sufficiently to permit a more complete enclosure of the extremity of the neck in the acetabulum. The trochanter being ill adjusted to the acetabulum is liable to displacement if motion is permitted, and in both instances there is complete loss of leverage for the abductors, therefore lessened muscular control and a consequent tendency toward flexion and adduction of the limb.

The procedure that the author presents is called a reconstruction operation, because it is designed to restore, as far as may be, the mechanical conditions required for security and controlled movement.

An incision is made in the shape of a half U, beginning about 1 inch behind the anterior superior spine and extending downward and backward, crossing the femur at a point 3 inches below the apex of the trochanter. The interval between the tensor vaginæ femoris and gluteus medius muscles is exposed; the capsule is opened and the head of the femur is removed.

The anterior margin of the gluteus minimus is followed to its insertion, and at this point, with a wide, thin chisel, the base of the trochanter is cut through in an oblique direction corresponding to the angle of the neck, including all its muscular attachments and often a part of the capsule. This flap of bone and muscle is turned upward, and the upper extremity of the femur, having been somewhat remodeled by cutting away the projections of the posterior intertrochanteric line, is freed from any restraining tissues and is thrust completely within the acetabulum at an angle of about 25 degrees of abduction.

The trochanter is then drawn downward, as far as its attachments will permit, and sufficient cortex having been removed from the lateral aspect of the femur, the two bare surfaces are apposed, the axis of the trochanter being thereby changed from a direction upward and inward to outward and upward. In this position it is secured, either by a drill or a peg, but usually by suture passed through the bones. The wound is closed in layers and a long plaster spica is applied fixing the limb in extension and abduction. When repair has sufficiently advanced, or in about four weeks, this may be replaced by a short spica, and patient is encouraged to bear weight in order to hasten the reconstruction of the articulation by a functional adaptation of the limb to the new conditions. When weight may be borne without discomfort, the support is removed and muscular control is reestablished by systematic exercises.

The reconstruction operation is designed primarily for cases of ununited fracture in which bone grafting seems impracticable, a class which under present conditions includes the majority of all patients. The

immediate and efficient treatment of fracture of the neck of the femur by the abduction method will be followed in most instances by repair, and if union fails when accurate apposition of the fractured surfaces has been maintained for a sufficient time, as confirmed by *x*-ray examination, it indicates a low vitality of the tissues, and therefore the advisability of the reconstruction operation in preference to bone grafting.

At the present time only a small proportion of the patients are treated efficiently at the time of the injury, and the field for both bone grafting and the reconstruction operation is much greater than it will be in the future.

It may be mentioned, in conclusion, that this type of operation is serviceable for other conditions than ununited fracture. For example, as a substitute for the arthrodesis in advanced arthritis deformans; for restoring motion in cases of ankylosis, particularly of the bilateral form, cases in which plastic operations are usually disappointing either because the joint again becomes fixed, or because of discomfort and eventual distortion of the limb; also in certain cases in which as the result of destructive disease of the joint there is upward displacement of the shaft.

Treatment of Gastric Ulcer.

SMITHIES (*International Journal of Gastroenterology*, July, 1921), after a brief summary of the histological, physiological, and clinical investigations bearing on the etiology of gastric ulcer, states that the principle involved in the treatment of this lesion first demands search for and eradication of the primary systemic fault. Often the localization of such is difficult. Inasmuch as foci of infection may exist in oral adenoid tissue, head sinuses, about teeth or in systemic lymph gland chains, these must be removed promptly. Intra-abdominal infections must likewise be eradicated, *e.g.*, diseased appendix, gall-bladder, Fallopian tubes, ovaries, ulcers, or subinfections of the bowel. It would appear quite inade-

quate to remove external local foci of infection and to leave behind intra-abdominal foci containing bacteria already accustomed to their environment, and ready to spread their operations to the gastric lining when opportunity offers. The removal of these variously situated germ centers constitutes a fundamental step toward the cure of gastric ulcer.

After local foci of infection have been removed, the mode of treatment is further influenced by the type of ulcer that has been proved to exist. Unless ulcers with much scar or causing great gastric deformity are demonstrated to be luetic, little hope of permanent relief by medical measures can be offered. Surgery gives the greatest prospect of relief to such cases. Intense pain, frequent hemorrhage, perforation or the danger of malignant change taking place in calloused ulcers likewise contraindicate non-operative care. Unfortunately we have no clinical or laboratory tests which indicate to us what type of ulcers will become malignant, or when early malignant change is taking place. The Roentgen demonstration of calloused ulcer exceeding 2 cm. diameter, when such is associated with history of frequently recurring ulcer symptoms and positive chemical test for blood constantly determined in the stools, forms a clinical hint that malignancy can be expected. The most competent clinicians are agreed that calloused, recurring ulcers, located in the pyloric end of the stomach, should be treated operatively. Excision should be performed, when mechanically possible. If excision is impracticable, then infolding, or cautery puncture, with or without gastrojejunostomy, yields the most satisfactory results. In non-obstructing ulcers gastrojejunostomy should always be accompanied by permanent pyloric closure.

Medical treatment is indicated only for ulcers associated with little callus, or for those located in portions of the stomach in which stenosis is not liable to result and surgical procedures cannot be carried out.

Smithies advises in the conservative treatment rest in bed for one to three weeks; physiologic rest for the stomach; abstinence from food for from three to seven days,

according to the case. The period of fast is determined best by clinical disappearance of gastric spasm. During the fast paraffin wax is chewed for fifteen minutes every hour; local applications to the abdomen, compresses saturated with alcohol and boric acid solution. Rectal feeding during the fasting period, using enemata containing one ounce of 50-per-cent alcohol; 1 ounce of glucose with normal salt solution to make 240 Cc. The nutrient enema is given at body temperature by the drop method; the drops flow at the rate of 30 to 60 per minute. During the first day of rectal feeding, gtt. x of tr. opii are given with each enema.

Food when given is in liquid form, warm, and in small quantities frequently repeated; barley water, rice, gruel, thin cream of wheat, thin creamed vegetable soup. Milk is not given as a rule because of its clotting and the fact that it remains longer in the stomach. The value of any medicine is doubtful. Sodium carbonate may come in serviceably at times. During the early period of treatment simple soap-suds enemata administered every second day, later on bland salts, may be given and liquid paraffin with equal quantities of warm cream. When lues is suspected vigorous specific therapy is indicated. Anemia when present is treated in appropriate fashion.

Enuresis.

CARTER (*Archives of Pediatrics*, May, 1921) after alluding to many forms of treatment, including disciplinary on the part of parents, outlines the management of these cases as follows:

All local morbid conditions should be discovered and corrected, not entirely because they may be etiological, but because their elimination is the proper thing to do for the general health of the child. Foci of infection, such as may be placed in tonsils and alveoli, should be removed. An adherent prepuce requires operation. There is no indication however for a circumcision just because the foreskin happens to be long. If it retracts easily, it should be left alone. Highly acid urine should be neutralized or

reduced in acidity by the administration of potassium citrate. This drug should be administered in 5- or 10-grain doses, every two hours, until the urine causes a strip of pink litmus paper to turn blue. Intestinal parasites, if they be present (and they are rare in American cities at least), should be expelled by appropriate drugs. Constipation should be overcome. High concentrations of urine should be corrected by giving plenty of water during the earlier hours of the day.

With all possible contributing factors removed, the major treatment of enuresis should be directed toward the training of the nervous system. As a requisite for undertaking treatment, a promise should be exacted from the mother or attendant of whole-hearted coöperation, for without this assistance treatment will be of no avail. It is perfectly useless to expect help from parents who are themselves so neurotic that they cannot bear to impose any sort of discipline on their offspring.

No fluid is permitted after a given hour in the afternoon. The child is taken up at regular intervals, thoroughly awakened, and directed to urinate. He is instructed to stop and start urination on order. The author states that diurnal control of the bladder should be completed not later than the eighteenth to the twenty-fourth month. A child of 2 or $2\frac{1}{2}$ years old, who habitually wets his clothing during the day and the bed during the night, cannot be said to be well trained. Experience has shown there is little need for drugs.

Sacral Anesthesia as Applied to Genito-urinary Surgery.

SYMS (*International Journal of Surgery*, June, 1921) observes that local anesthesia in the neighborhood of the anus by the local infiltration method is dangerous, as the region cannot be adequately sterilized. Sacral anesthesia is devoid of that danger.

Before one attempts this procedure it will be necessary for him to familiarize himself with the anatomy of the sacrum, for the injection is to be made into the

sacral canal. The orifice or entrance to the sacral canal is found at what is known as the hiatus sacralis. This hiatus is formed by the absence of the last spinous process, and practically it may be recognized by two prominences or cornua which are found one on either side of the opening. The hiatus is closed by a dense fibrous membrane which is stretched like a drumhead over the orifice. Usually the hiatus may be recognized by palpating the two bony prominences above mentioned. Of course, it is to be found a short but a variable distance above the upper end of the coccyx. If the coccyx is movable it will be easy to locate its upper end and thus the lower end of the sacrum. If the two bones are ankylosed, it may not be so easy, but there is always an angle at the point of junction, and this will help us in searching for and finding the bony cornua and the dimple between them which represents the hiatus.

The patient is placed in a prone position. A pillow under the pelvis will help. By careful palpation the essential anatomical points are recognized and located; the region is painted with iodine; a small amount of novocaine solution is infiltrated in the superficial structures. Then a two and a half or three-inch sharp-pointed needle (non-breakable) is introduced into the hiatus, plunged through the drumhead membrane, and then pushed a short distance further in the line of the canal.

Usually one can feel the needle plunge through the dense membrane which closes the canal. After this membrane is penetrated, the needle should not be introduced much further; 2 or 3 centimeters are sufficient. Thompson has found that the lower end of the dura is on an average 5.8 cm. from the hiatus—the shortest was 4 cm., the longest 7 cm. The needle is introduced detached from the syringe. If spinal fluid should appear, the needle should be slightly withdrawn until the fluid stops flowing. If blood should flow through the needle, one should assume that he has penetrated a vein, and the needle should be slightly withdrawn. Being assured that it is in the canal, one connects up the syringe

and proceeds to inject the 30 Cc. of solution. If the needle is properly in the canal, there will be practically no resistance to the flow of the fluid. It will be as though one were injecting into space.

Anesthesia should be complete in the region of the anus within ten to twenty minutes, and in other areas of this region within a variable period, ranging from ten to thirty minutes. The anesthesia lasts several hours, as it is better to wait long enough rather than to begin too soon.

The region anesthetized is about the area which sits on a saddle—in other words, the region around the anus, the perineum, the scrotum, and later the penis. Sometimes anesthesia extends up as high as the umbilicus, but this cannot be relied upon.

One of the supreme tests of complete anesthesia is the dilating of the sphincter ani. With sacral anesthesia one may fully dilate the sphincter, clamp and burn off with the cautery large hemorrhoidal masses without having the patient flinch or show the slightest sign of pain.

The advantages of this method are obvious. It seems to be free from risk. It enables us to operate with the same freedom as we would if we used a general anesthetic, and yet it is free from all disturbance to the patient and all the dangers that attend general anesthesia. This method has all the advantages of local anesthesia, and yet it is free from its dangers in an area which cannot be surgically sterilized.

It enables us to perform the radical operation for hemorrhoids in patients to whom we do not care to give a general anesthetic. Thus we are not prompted nor tempted to perform the so-called minor or tinkering operations, which are after all more dangerous than the radical operation performed with the clamp and cautery.

It takes some patients out of the inoperable class, notably those suffering from pulmonary diseases, and those with impaired circulation, with cardiovascular and renal conditions, which would otherwise make them unsafe as surgical risks.

It presents one more reason, if any were needed, why prostatectomy should be per-

formed by the perineal route. Some seriously ill patients have been able to undergo the operation without shock or depression, and as their bladders were uninjured and were continent, they have been able to be up and about twenty-four hours after the operation, and some of them have been able to leave the hospital within five days.

As sensation returns very slowly and the anesthesia lasts many hours, gradually wearing off, patients suffer much less from postoperative pain and discomfort than they do with other forms of anesthesia.

The author has used this method with success and satisfaction in operations in the region in which it is applicable. Among these are: Hemorrhoidectomy by the clamp and cautery and other methods; operations for fistula in ano; for rectal fissures; for opening ischio-rectal abscesses.

In its application to genito-urinary surgery he has used it in perineal prostatectomy; in perineal section for bladder drainage; in external urethrotomies with and without a guide, and for opening prostatic abscesses; in various operations on the scrotum, such as hydrocele and varicocele; and in circumcision in the adult.

Treatment of Cutaneous Anthrax.

OGILVIE and HALL (*British Medical Journal*, June 18, 1921) report cutaneous anthrax in 48 cases, this subject having been revived by repeated cases occurring from the use of shaving brushes. They quote from a circular issued by the Ministry of Health, January, 1921, to the effect that of 200 cases treated by serum only 4 per cent died. Of the 397 cases treated by excision only 11 per cent died; of 174 cases treated by excision and serum 14 per cent died; and of 29 cases in which there was no special treatment 48 per cent died.

At Guy's Hospital treatment was based on excision plus serum. Of four cases treated by serum alone, the mortality was 25 per cent; 6 of excision alone 16 per cent; 37 of excision and serum 8 plus per cent.

The authors hold that it is probable that the series from Guy's Hospital, though

small, gives a fair picture, and that the death-rate when both methods are combined is notably lower than when either is used alone. In the early stages of anthrax the bacilli are limited to the pustule and its immediate neighborhood. Excision by itself will assure a cure in about 90 per cent of cases in a disease having a natural mortality of something like 50 per cent, while serum at best cannot be relied upon to avoid a fatal issue in all cases. In view of the danger of anthrax and the local nature of the infection in the early stages, it therefore appears to be the wiser course to combine the two methods, which are both known to be good and which cannot be mutually antagonistic, and thus to give the patient every chance. Little or no importance should be attached to the resulting scar. The combination of excision and serum treatment as used at Guy's Hospital is probably the most rational and the safest course in all cases of cutaneous anthrax which have not reached the stage of a septicemia.

As to the treatment of persons infected, the circular issued by the Ministry of Health is quoted as follows:

"In general, the best treatment for a case of anthrax is physiological rest of the part affected, combined with intravenous injection of antianthrax serum; 60 to 80 Cc. on the first day, and 60 Cc. on the day following if there has been no reaction (shown by a rise of temperature) and the general condition has not improved. Excision is unnecessary. Subcutaneous injection into the abdominal wall of 30 Cc. has apparently been successful in many cases, repeated, if necessary, on successive days."

Treatment of Burns.

Writing on this subject COLCORD (*International Journal of Surgery*, June, 1921) states that there are two kinds of burns that are so different from all others that he would especially call attention to them. First, the ultraviolet-ray burn. The effects of the ultraviolet-ray burn begin about six hours after it is inflicted. The *x*-ray burn

effects are not seen for two or three weeks after infliction.

He speaks of the causes of death as being due to what is termed shock if it occurs in twelve hours. After three days it is probably due to an overwhelming dose of the toxalbumins and emboli which have reached the vital organs. He says he has never seen but one case of edema of the glottis from breathing in the flame. It is the same with the eyes: There may be a flash of flame from the furnace with a tongue of flame. It is pretty hot for a few seconds, and the man's face is burned, his eyelashes are burned off and eyelids burned, but his cornea is not burned. Paraffin treatment receives first choice. The writer strongly advises an ointment made up of carbolic acid, thymol, menthol, camphor, of each 5 grains; ichthyol, balsam of Peru, of each 10 grains; zinc oxide, starch, of each 1½ drachms; petrolatum to make six ounces. Mix well.

He has treated over 2000 burns with this ointment, and is convinced it has the following advantages: It is an efficient germicide and not only renders the surrounding skin relatively sterile, but also keeps the discharges and burned surfaces approximately free from germs and, therefore, free from pus. The only cases in which there is pus are in those who take off their own dressings and so infect the burn; those who come after several hours or days with burns already infected; those burned near the mouth, nose, or hair, or near the buttocks in babies; those suffering from bad sloughing burns of the third degree. The latter are treated as soon as a slough begins to form with continuous wet dressing of Ochsner's fluid, which prevents bad odor or pus.

This ointment is a powerful local anesthetic and soon stops pain, especially in burns of the first or second degree. A badly burned baby, screaming with pain, will often go to sleep from the relief afforded before the bandages are all on.

It is a deodorizer. Cases of burns dressed with it have no bad odor except badly sloughing third-degree ones, and the odor is best controlled by the wet dressing.

It is non-poisonous; there has been no case in which absorption of the drug has produced any unpleasant symptoms.

It is easily and quickly applied and convenient to carry in the grip.

With this ointment, dressings do not stick as they do with picric acid and many other applications. Men with slight burns can work in comfort.

It is especially adapted to mill and office practice, where we do not have the perfect cleanliness of the hospital, and where the open-air (Sneve) dry method or the continuous bath is impracticable. It is the only method that will keep a burn clean in the dirty homes of some of the foreigners working in the steel mills.

The recovery is much more rapid by this method, because the edema and inflammation of the skin soon subside; there is no pus; granulation and epidermis formation is stimulated.

There is less scarring because less destruction of tissue.

Some years ago the reporter treated 30 cases with picric acid; there was a general demand from these patients that he return to the ointment.

The two essentials of this ointment are: A paraffin of medium melting point—about 105°; the deodorant-anesthetic-antiseptic made by combining four crystals to form one new chemical substance.

The author imagines he is called to treat a severe burn of the second degree. He at once administers a hypodermic of $\frac{1}{4}$ to $\frac{1}{2}$ grain of morphia and 1/100 to 1/50 grain of atropine to stop pain and apprehension and combat the shock. The room should be warm—80° to 85°—cleared of unnecessary furniture and bystanders, and hot-water bottles or hot bricks should be ready. Preparations should be made for hypodermoclysis or a Murphy enema.

It must be borne in mind that in every bad burn three things are more important than the local treatment: Stop pain; combat shock; provide for dilution and elimination of the toxins, which at once are thrown into the blood.

The clothing should be carefully cut

away—never pulled off or dragged over the burned area. A burn is, at first, sterile; it should be kept so.

Pieces of gauze of convenient size are now spread thickly with the ointment and applied somewhat beyond the burned areas. Over this cotton is placed, and over all a bandage. The patient is put to bed, and if shock continues the normal salt solution should be repeated every eight hours, giving plenty of water to drink. Nourishment for the first three days should be liquid on account of the intense congestion of the alimentary tract. Then we may gradually feed according to conditions.

The Clinical Application of Blood Chemistry.

STIER and HOLLISTER (*Northwest Medicine*, June, 1921) give a description of their procedures. By chemical means one is enabled to give a proper valuation of a case where some kidney insufficiency exists, be it in a nephritis or diabetes.

Retention of the products of metabolism takes place in the order of their solubilities. Therefore, uric acid, the least soluble and most difficult constituent to be excreted, is the first to be retained. Above 3 mg. per 100 Cc. represents a retention. Urea comes next in solubility, and a content above 15 mg. per 100 Cc. represents a retention. The most soluble is creatinine, and all values above 2 mg. per 100 Cc. represent a retention. Because it is the last of the products to be retained, it is invaluable from a prognostic standpoint, all figures above 5 mg. usually terminating fatally in from but a few days to two months.

Blood-sugar values above 120 mg. per 100 Cc. denote a hyperglycemia, and in cases of diabetes indicate active diet to bring the values to as normal a figure as possible. An acidosis exists when the acidity of the blood is threatened, as indicated by the failure of the carbon dioxide to combine with the patient's blood plasma. When values fall below 50 per cent an acidosis exists.

In surgery blood chemical methods are

particularly applicable in elderly applicants for operation and in young individuals, in whom some kidney lesion exists. Preliminary flushing of the kidney and other preparations, together with a suitable anesthetic, will do much toward reducing our mortality.

Since we have exact methods of establishing a diagnosis and prognosis, we owe it to our patients to give them the benefit of these scientific determinations.

Treatment of Urinary Incontinence by Electrical Methods.

HERNAMAN-JOHNSON (*Lancet*, June 18, 1921) observes that when ordinary treatment fails in this disease parents are often told that the symptoms will disappear with the onset of puberty. The author asks how many young men who inexplicably refuse invitations, who are "curious" in their behavior, who shun the society of the other sex, are thus afflicted? The late war showed that of apparently healthy recruits, in all countries and from all classes, an unexpectedly large percentage were afflicted with functionary urinary troubles. Yet in private practice the condition seems rarely met with among otherwise healthy adults.

It is stated the two things most likely to be productive of incontinence are stone in the bladder and scybalæ in the rectum. Treatment by drugs and suggestion are dismissed without large belief in their efficacy. Electrical treatment receives warm commendation. Interrupted currents are employed to produce rhythmical contraction of the abdominal muscles; the condenser electrode is inserted per rectum. In this case the patient feels nothing, but a spark may be drawn from any part of his body. These methods both aim at increasing local and general tone. They should always be employed for some weeks before anything more drastic is contemplated. For the first week or ten days the method should be unaccompanied by any verbal suggestion, other than an initial explanatory statement in the case of older children. These should be told that the brain controls the bladder even during sleep, provided that it gets

proper messages as to the state of affairs there; and that the effect of the electricity will be to increase the strength of the message—"to make the telephone bell ring more loudly."

If there is no improvement within ten days a definite suggestion should be made to the effect that, although the bladder is not yet strong enough to hold its water all night, yet its distress signals will wake the patient before an accident happens. This is often successful, even though previously, without the use of electricity, the suggestion may have been made in vain. (The kind of suggestion here referred to is, of course, ordinary "waking suggestion" and persuasion; hypnosis should not be employed, except by experts in the subject). If the patient can be got to wake regularly feeling a desire to micturate, the battle is practically won, and in most cases undisturbed nights are ultimately arrived at. When it is not possible to get the child to wake as the result of sensation from his bladder, an alternative is to have him awakened at certain fixed hours for the purpose of making water. This is generally best accomplished by posthypnotic suggestion, and is probably not made any easier to accomplish by electrical treatment, which latter aims at increasing the intensity of the natural call.

Internal methods of electrical application are unpleasant and sometimes even painful. In unskilled hands they may be dangerous. The simplest method is to introduce a metal bougie into the bladder and pass a faradic current through it up to the patient's limit of tolerance. The risks are no more than such as are involved when any metallic instrument is passed into the bladder. A second method is to fill the bladder with a weak solution of zinc sulphate and pass into the bladder a rubber catheter containing a wire of soft metal. Care must be taken that the metal does not at any point come into contact with the wall of the bladder or the urethra. A current of 10 to 15 milliamperes is then passed for ten minutes, the wire being positive; a pad is placed under the buttocks to form the negative pole. This

proceeding may be repeated every other day for a fortnight.

The above mentioned methods increase sensibility as well as tone. They ultimately produce a certain amount of soreness which may aid in stimulating the patient's attention.

As to prognosis, on the whole, the cases in which the trouble comes on in apparently healthy children at the age of four or five are the most difficult to cure; but it should be possible to get a satisfactory result in at least 50 per cent of such cases, even when various other methods have failed. The backward child, physically and mentally undeveloped, benefits in a remarkable manner from the general effects of electricity, unless there is some actual congenital defect. The cure of the incontinence may, however, be delayed—the child has first to be brought to a stage of mental development where he can coöperate with the physician. The change in the physical and mental outlook of such little patients after a few weeks' treatment is often most gratifying.

The time required to effect a cure in a favorable case is about a month, the patient being seen four or five days a week. A case which is definitely benefited but not cured in four weeks may require a further month to banish the trouble. On the other hand, if no improvement takes place in a month, it is best to have the case treated by hypnosis, either alone or in combination with some electrical procedure which has not previously been used.

At the Cambridge Hospital, Aldershot, during the war, statistics were worked out for several hundred cases; 65 per cent were cured—i. e., they were reported as free from trouble a month after their return to their regiments. But these patients were all otherwise well-developed lads of between nineteen and twenty. Taking all types of patients, at all ages—which in his private practice have ranged from 3½ to 27—the percentage of cures to be counted on is over 50, but probably less than 60. This is a conservative estimate. One's results improve with experience, and, with-

out being unduly optimistic, it is permissible to expect that in future it will be possible to attain success in three out of every four such cases.

Fifty Cases of Hour-glass Stomach.

THOMAS (*British Journal of Surgery*, July, 1921) reports fifty consecutive cases of this deformity.

The most noticeable feature was the long duration of symptoms before surgical aid had been resorted to—with the exception of three patients, whose symptoms had only lasted one, two, and three years respectively. All the others had complained of gastric trouble for periods varying from five to thirty years; taking an average, it worked out at nine years, and most of the sufferers had been under medical treatment intermittently throughout.

In no single patient had malignant disease supervened, which, although suspected in two cases, was disproved on operation.

It had not been possible in a single case definitely to diagnose bilocular stomach by ordinary methods, radiography being essential.

Two cases (in addition to the four perforated ulcers) had been previously operated upon—one by gastropasty and one by posterior gastroenterostomy — though another one had had the gall-bladder drained (no stone found), the symptoms having suggested biliary colic.

From this series of cases it appears that the acute hemorrhagic variety of gastric ulcer rarely leads to this deformity, but rather the chronic ulcer on the lesser curve with many years' history of a continuous or intermittent type. Many ulcers had completely healed, leaving a hard scar which in process of years had drawn to itself the adjacent areas of gastric wall so as to produce the contraction. Many had unhealed ulcers—some with extensive adhesions to liver, pancreas, and even to the anterior abdominal wall—while others had a fold of great omentum caught up to the lesser curvature, suggestive of old partial perforation.

Surgical intervention is the only possible

means of cure, and there is no condition in surgery that may call for so great a variety of procedures to deal with the degrees and complications met with; and although the radiographic evidence affords valuable help, it is impossible in any given case to have the slightest idea beforehand what surgical maneuver will be resorted to.

In this series the following procedures have been carried out:

When the pouches have been large, with a fairly wide waist between, with much active muscular wall, gastropasty was chosen in six cases—also in a seventh, but combined with a posterior gastroenterostomy to the distal pouch on account of pyloric cicatrization.

When the pouches were large, the constriction narrow and fibrous, and in several with extensive adhesions to the liver, gastrogastrostomy proved satisfactory in 15 cases.

Posterior gastroenterostomy performed in the proximal pouch suggested itself in 14 cases; in two of these the union was made opposite the ulceration but extending well into both pouches, when the proximal sac was small and high up.

Where the pouches were about equal in size and the constriction extensive, with pyloric stenosis in addition, double posterior gastroenterostomy was resorted to in two cases.

In three cases complicated by extensive adhesions in the lesser sac of the peritoneum to the pancreas, a retrocolic anterior gastroenterostomy was possible.

In three of the patients, each having a very small proximal pouch, with the lesser curve adherent to the liver, an anterior gastroenterostomy seemed essential: and in one of these, the intestinal loop being long, an enteroenterostomy was added.

In one very difficult recent case an extensive area at the constriction was adherent to the anterior abdominal wall at the level of the umbilicus, the stomach being much proptosed and acutely kinked, leaving only a small piece of available stomach in the front of the proximal pouch. It seemed inadvisable to separate the stomach from the abdominal wall, it being almost certain

that if this were attempted the stomach would be extensively opened and thus increase difficulties and the risk to a patient extremely ill and emaciated. The surgeon was able to mobilize the second part of the duodenum, and perform a gastroduodenostomy between the proximal pouch and the duodenum above the area adherent to the abdominal wall.

In another complicated condition the lesser curve was intimately incorporated with the liver, the proximal pouch small and adherent posteriorly, while the front of the distal sac had hardly any portion not adherent to the liver; pyloric stenosis was present in addition. This looked for the moment an impossible problem to solve; but thanks to a retrocolic anterior gastroenterostomy to the proximal and a posterior gastroenterostomy to the distal pouch, the case was carried safely through.

The last two cases of the series necessitated partial gastrectomy.

In spite of all efforts to improve the condition of the patient before operation, and the care taken on the operating table to avoid shock, seven deaths are to be recorded in this series: three following posterior gastroenterostomy (two women, one man); two following gastrogastrostomy (one three weeks later from pneumonia and empyema); one following retrocolic anterior gastroenterostomy in a male; and one following partial gastrectomy, also in a male.

Three of the patients succumbed to bronchopneumonia in a few days, and one died suddenly from pulmonary embolism on the fourteenth day. One gastrectomy case died suddenly next day, and two others simply from lack of recuperative power.

Ether was administered by the open method in all cases by a skilled anesthetist.

The mortality-rate may appear high; but what mostly impressed the operator was the astonishing recovery in a great many almost hopeless cases, in persons reduced to extreme emaciation through long years of suffering. It is hoped that, in future, much earlier resort will be made to radiographic investigation in vague cases of chronic in-

digestion that do not readily yield to medicinal and dietetic treatment.

With such a variety of operations necessary to deal with this condition, it was interesting to ascertain the end-result to the patient. It does not appear that any particular type of operation had much to do with the final result, provided a free flow had been established from the stomach. Only six have complained of gastric symptoms since operation; one operated upon five years ago has "some vomiting;" one operated upon three years ago complains of "vomiting;" two have some indigestion; one had a severe attack of hematemesis one year after operation, and was subsequently radiographed, but she has now been well for four years. Four have died from diseases unconnected with stomach trouble.

All the others send expressions of thanks and gratitude, and the most frequent answers have been "eat anything," "quite well," "very good health," and one who had suffered severe pain for many years alludes to the operation as "a miracle."

An Estimate of the Value of Local Anesthesia in the Surgery of To-day.

BARTLETT (*Surgery, Gynecology and Obstetrics*, July, 1921) states that a large amount of fluid used in infiltration increases the patient's intake in a definite manner and without causing discomfort. This reasoning was carried to the extent of gradually increasing the amount of fluid while decreasing the percentage of novocaine from one-half to one-sixteenth, by virtue of which he now administers any desired quantity of fluid by hypodermoclysis without inducing any real suffering; in fact, the procedure attracts very little attention in many instances.

It is stated in Braun's epoch-marking work on local anesthesia that the gall-bladder is a forbidden field. It may be worth while to mention in this connection that the writer has repeatedly drained the gall-bladder and removed deeply seated stones without discomfort to the patient, after aspirating the bile and then replacing it with 5-per-cent cocaine for a very brief

period. This, of course, after a simple infiltration of the abdominal wall.

Bartlett has injected the anterior sacral nerves with the abdomen open, under ether, for the performance of second operations on the rectum, anus, and external genitalia. He does not believe it is even necessary to strike the nerves with accuracy, as one gets a fair regional anesthesia by merely making a massive injection under the soft tissues covering the hollow of the sacrum, thus causing fluid to suffuse everything in the neighborhood. One saves a large amount of ether while the abdomen is being closed under infiltration and during the period of preparing a second field for operation on the organs mentioned.

The author by way of repetition stresses the plan used so frequently in his clinic of beginning infiltration and ether at the same time, then doing a laparotomy and employing no more ether during the rest of the procedure, except when the patient shows unmistakable signs of needing it under peak load.

It is to be definitely understood that ether by the drop method is the anesthetic of choice in his clinic for major surgery in general, and local anesthesia in some form for minor surgery. But he goes much further than this; hence an attempt has been made in this address to deal with the large number of special considerations which do not fall into either one of the above mentioned classes.

One must always keep in mind that local anesthesia has definite limits which are not to be transgressed; Bartlett has attempted to make many of them clear.

He believes that with increasing experience and better training we shall some day have to establish indications for general anesthesia rather than for local, as is the common experience to-day. It will then seem no more reasonable to anesthetize the entire organism for a strictly local operation on it than it would at the present time to bind or splint the entire body for an injury to an extremity.

Surely no one will advocate the use of local anesthesia to the point of interfering

with the smooth and rapid conduct of a surgical procedure.

It may be safely stated that the anesthetization should never be larger than the operation; for example, one should not under ordinary circumstances attempt a radical breast operation, or any one of the larger abdominal procedures which involve both sides of the midline, under local anesthesia alone.

The operator will have to train himself especially for this work if he expects to be successful in it, although in a busy clinic it is unquestionably the correct plan to have one associate who has this phase of surgery wholly in his hands.

There is a very definite field for the local anesthetist. Such an individual should play a rôle similar to that which is well known in general anesthesia. His services ought to be in demand by the surgeon who makes only an occasional use of these methods, or by one who is not temperamentally suited to the acquirement of them.

Diagnosis and Indications for Operation in Acute Mastoiditis.

MURRAY (*Minnesota Medicine*, July, 1921) observes that a considerable proportion of mastoid involvement does not present at any time the usual signs of mastoiditis. This is more likely to occur in adult cases than in children. During childhood the mastoid cortex is thin and less resistant to pressure from within; infection is transmitted more readily through the cortex, periostitis and subperiosteal abscess are more likely to occur, and the presence of a patent squamomastoid suture, which is likely to be present until the age of two years and sometimes considerably later, serves as a pathway for the transmission of infection from the antrum to the cortex. In adult life, and especially with advanced age, the mastoid cortex becomes hard and resistant, due to osteosclerotic changes which occur, and unless there is free drainage from all the involved cells and antrum into the tympanic cavity and from the tympanic cavity through the membrana

tympani, the infection is likely to extend in other directions through the cortex and cause intracranial complications.

On account of the close anatomical relationship between the antrum and the tympanic cavity, it is doubtful if the antrum escapes infection in any severe acute purulent otitis media, and if we consider the antrum as a part of the middle ear, the presence of the classical signs of the mastoiditis such as temperature, pain, tenderness, discharge and external changes over the mastoid bone, do not necessarily indicate a mastoiditis; at least they may not constitute an indication for operation. Such symptoms, including redness and swelling of the soft tissues over the mastoid, may be present early in the course of an acute purulent otitis media, especially in children, before drainage has taken place through the drumhead. Free incision of the membrana tympani, with establishment of drainage, may result in the rapid subsidence of all of these symptoms. Their persistence after drainage has been obtained from the middle ear is of diagnostic importance and becomes an indication for operation.

Temperature varies greatly as a symptom of acute mastoiditis, and when present is usually of low degree, especially in adult cases. In uncomplicated cases of acute mastoiditis in adults, temperature is seldom high and frequently drops to normal on the establishment of free drainage by incision or rupture of the membrana tympani. In children temperature is in general higher than in adults, but extensive involvement of the mastoid may be present without temperature if drainage is free. A recurrence of temperature, with free tympanic drainage, is an important sign of extension of mastoid involvement, and a persistent low temperature, provided drainage is free and no other cause for temperature is present, may be the only apparent indication for operation.

Pain is a very variable symptom, and in uncomplicated cases of acute mastoiditis with free drainage from the mastoid cavities into the tympanum and from the tympanum into the external canal, it is not

likely to be a prominent symptom, and extensive involvement of the mastoid process may be present, without the patient complaining of pain. The continuance of pain, however, after free drainage has been obtained through the drumhead is an indication that the mastoid is involved and that there is not free drainage between the areas of infection in the mastoid and the tympanic cavity, due probably to swelling of the mucous membrane lining the aditus ad antrum or the communication between the antrum and cells, thus blocking drainage. The occurrence of pain on cessation or diminution of discharge from the middle ear is also an indication of mastoid involvement unless the cessation of discharge is due to a sudden closure of the opening in the membrana tympani.

Tenderness is a symptom that is much more commonly present, and is probably the most reliable of all subjective symptoms of acute mastoiditis, as nearly all cases will show some tenderness over some area of the mastoid.

The type of mastoid will influence to a considerable extent the degree of tenderness present. In the pneumatic type with well-developed cells and a comparatively thin cortex, the tenderness may be pronounced, while in mastoids with a thick, hard cortex, tenderness may not be elicited except by very firm pressure, and in some cases it is absent entirely.

The location of the tenderness is of some importance. When located over the antrum or along the posterior portion of the mastoid process, it is more indicative of mastoiditis than when located at the tip.

Recurring tenderness is highly significant of acute mastoiditis. In the early stages of acute otitis media, tenderness of the mastoid may be present and subside in a day or two. If it then recurs and there is tympanic drainage present, operation is indicated if it persists for twenty-four to forty-eight hours, even though there are no other signs present indicating the necessity for opening the mastoid. It should be remembered that it is quite possible to have an extensive mastoid involvement without any

sign of tenderness, and absence of tenderness must not be considered an absolute sign that operation is not indicated.

External changes over the mastoid bone, when present, usually furnish positive indications for operation. It sometimes happens, however, that in the early stages of an acute otitis media, before the drumhead ruptures or when the drainage through the membrana tympani is insufficient, external changes may occur, such as redness and edema, due to periostitis. This is especially likely to occur in children, and it often happens that thorough incision of the membrana tympani and the establishment of free drainage will be followed by the rapid subsidence of signs of mastoid involvement.

Changes occur at the inner end of the external auditory canal in a considerable proportion of cases, and when present are a valuable diagnostic sign of mastoid infection. These changes consist of a swelling or sagging of the superior and posterior wall of the canal in close proximity to the membrana tympani and indicate a periostitis which has been extended from the infection in the tympanic cavity or is due to pus which has extended from infected mastoid cells. It is frequently an early sign of acute mastoiditis and is considered an operative indication. The character and duration of the aural discharge is often an important sign of mastoiditis.

A chronic purulent otitis media not only means a chronic mastoiditis with the possibility of complications, but it means the constant presence of a dangerous focus of infection, and it means the certainty of progressive impairment of the function of the middle ear.

Blood examinations are not of much value in uncomplicated mastoiditis. There is generally a moderate leucocytosis. A high polymorphonuclear percentage would indicate the passage of microorganisms into venous circulation and would be suggestive of a sinus complication.

The x-ray is of value in mastoid diagnosis and will frequently give us valuable information as to the pathological changes which have occurred within the mastoid process.

During the early stages of an acute mastoiditis, the radiograph will show a cloudiness over the areas of the mastoid cells. This does not constitute an indication for operation, as it may be due to simple congestion of the mucous membrane lining the cells. If the plate shows that the septa between the cells are broken down or if there be shadows indicating the collection of pus in definite areas of the bone, it will indicate the necessity of operation. The radiograph also furnishes valuable information as to the type of mastoid present, location of the lateral and sigmoid sinuses, the presence of xygomatic cells, and it may be the means of diagnosing a perisinus or epidural abscess.

Local Anesthesia for Extensive Abdominal Operations.

FINSTERER (*American Journal of Surgery*, July, 1912) states that local anesthesia is far superior to general narcosis for the mere reason that the contraindications to narcosis which held good heretofore and because thereof to the operation itself, namely, severe affections of the heart and lungs, advanced age and progressive cachexia are of no importance in local anesthesia, so that we can still operate upon patients for whom every physician must decline an operation under general narcosis. This means that with the systematic improvement of local anesthesia its field of usefulness can be greatly enlarged.

In order to bring about complete painlessness in abdominal operations it is absolutely necessary to follow the technique of local anesthesia exactly. On the basis of an experience in more than fifteen hundred laparotomies as performed by him under local anesthesia, Finsterer confirms the statements made in regard to similar operations by Lennander, Kappis, and others. The opening and suturing of the peritoneum of the anterior abdominal wall is the most painful part of the operation. It is therefore absolutely necessary to avoid this pain, and this can be achieved, as for

example in laparotomy of the upper abdominal region, by making the abdominal walls insensible to pain with fan-shaped injections of a half-per-cent solution of novocaine on the outer margin of the rectus. The infiltration of the section surface alone does not suffice, because the pressure of the abdominal spatula on the lateral portion of the already sensitive peritoneum causes pain. In all laparotomies, therefore, the conducting nerves must be blocked at least a hand's breadth centrally from the incision by an exact conducting anesthesia.

The touching and squeezing of stomach and intestines are painless if pulling of the mesentery is avoided. The mesentery itself contains pain-conducting nerves, therefore this also must be blocked by novocaine.

In order to carry out a stomach reaction actually without pain we must, besides an exact conducting anesthesia of the abdominal walls, inject a novocaine solution of thirty to forty cubic centimeters at the base of the small omentum into the ligamentum hepatoduodenale, at the base of the mesocolon transversum, in the peritoneal transit from the pancreas. For a resection of the small intestines the injection is made at the base of the mesentery. As the stomach, the small intestines and the gall-bladder are supplied by the nervi splanchnici, these can be made insensible by an injection of seventy to one hundred cubic centimeters of a one-half-per-cent novocaine solution on the anterior surface of the twelfth thoracic vertebra (splanchnicus anesthesia according to Braun). By an exact conducting anesthesia, stomach resections may be performed absolutely without pain and without the slightest help of ether.

In the urgent operations for intestinal obstruction or peritonitis, the indications for local anesthesia may be considerably enlarged. As in such affections a paralysis of the vasomotor nerve is present, and consequently a diminution of blood-pressure, we must avoid any further decrease of the blood-pressure ending in a collapse. Therefore we may employ neither chloroform nor a deep ether narcosis, as these would de-

crease the blood-pressure. But in these affections the central application of novocaine in the form of lumbar anesthesia or of paravertebral conducting anesthesia is contraindicated, as either may lead to diminution of the blood-pressure and therewith to collapse. An exact conducting anesthesia of the abdominal walls for the opening of the abdomen, combined with a short ether narcosis for the purpose of finding the cause of the intestinal occlusion, answers well. The blood-pressure is not diminished thereby, but, on the contrary, the ether narcosis raises the blood-pressure which is diminished by the eventration of the intestinal loops.

The use of local anesthesia favorably influences the postoperative course also. The cases of death of so-called operation shock, which is to be interpreted only as protracted narcosis effect, can be entirely avoided, and the postoperative stomach and intestinal atonies with secondary stomach dilatation and peritonitis are almost wholly missing. Hackenbruch and Reinhard have also confirmed the fact that the postoperative course even after the severest operation is quite unusually good. By local anesthesia the fatal lung complications are also almost entirely avoided.

Ringworm of the Nails.

HODGES (*Archives of Dermatology and Syphilology*, July, 1921) contributes a careful study to this subject, beautifully illustrated, describing in full the various culture methods. He offers this contribution largely as the result of being a victim of this affection for about thirty-five years. A final demonstration of its true nature and successful treatment has stimulated the author to an intensive study of this subject.

Sixteen cases of this disease, termed onychomycosis, are embraced in the report. The presence of a fungus of the trichophyton type has been established in every case by a microscopic examination of the nail paring.

The author states that the majority of

these cases were found in a small city of 12,000 inhabitants, several being acquaintances, indicating a prevalence considerably greater than reported by Foster of one to 5000 among immigrants at Ellis Island. Exact statistics are not available, but the inclusion of several cases not embraced in this report, but observed by local physicians, would indicate a ratio of at least one case to each 500 of population—a prevalence ten times greater than reported by Foster among foreign immigrants. These cases to a certain extent represent a special class, among them being included a physician, a lawyer, and a professor, American-born people who bestow more than ordinary care on personal cleanliness.

No cases were found due to favus or trichophytosis of species apparently seldom responsible for scalp ringworm, but specifically inclined to attack the nails.

With one exception, all the patients were men. The affection always began at the free margin of the nail and slowly undermined the nail plate until it became so loosened that it was either shed or removed by trimming. Subsequent growth showed a thickened nail of worm-eaten appearance, more or less irregular and of a dirty yellowish color, the outgrowing diseased nail plate often being shed at intervals of a few months. No member of the family or associates were affected with ringworm of the scalp.

As to treatment the author, who is a chemist, speaks with some diffidence. He says for thirty-five years the patient in Case 1—the true nature of whose disease had not been recognized—had been treated with various applications with little improvement, except to allay somewhat from time to time the severity of the eruption on the hands and feet. Following a demonstration of its true nature, several forms of treatment were tried, among them soaking the nails in a solution of mercuric chloride followed by application of ammoniated mercury ointment. No improvement of the nails was noted after about two months of such treatment. Roentgen-ray treatment was not tried in this case, but in

two other cases of this series a few exposures had been given without apparent improvement.

A trial of Whitfield's ointment—benzoic acid 4 parts, salicylic acid 2 parts, petrolatum 30 parts—was prompted by the success reported by Ormsby and Mitchell attending its use in treatment of ringworm of the hands and feet. The immediate effects of this ointment after a few days' use were so pronounced and favorable on the skin eruption that attention was directed to the nails. In order to reach the fungus, it was found necessary to scrape the nails repeatedly after applying a solution of potassium hydroxide of about 10-per-cent strength. Whitfield's ointment was applied at night, being held in place on each nail with a small piece of cloth and narrow strips of adhesive cloth. Whatever adhesive matter from the cloth remained was easily removed the next morning with a cloth and a little gasoline. Treatment, although productive of some inflammation, interfered in no way with daily duties. If irritation became too severe, use of the ointment was discontinued for a few days or else it was diluted considerably with

petrolatum. Successful destruction of the fungus was in several instances accompanied by some pus formation under the diseased nail bed. Partially invaded nails gave more trouble than when the entire nail was involved, for in spite of close trimming the fungus would apparently always have invaded some place a little farther back under the nail plate than could be reached by the ointment, and it was only after trimming well back of the infected portion that success was attained.

Owing to the possibility of keeping the ointment more constantly in contact with the toe-nails, it was not found necessary to use the potash solution, as the application of the ointment softened the nail sufficiently for the removal of the affected part by close trimming.

With this persistent treatment improvement was soon noted, and within four months the finger-nails had attained their normal growth. The toe-nails required a somewhat longer time to grow out. There has been no reinfection of the finger-nails after a lapse of two years, but two of the toe-nails after several months showed some reinfection requiring further treatment.

Correspondence

Lost and Found Radium.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: You might like to publish this account of the temporary loss of a valuable tube of radium, which occurred under the eye of my friend Dr. Thurstan Holland of Liverpool, one of the leading α -ray experts in the kingdom. We had a similar accident in my own hospital about five years ago, when we were treating a patient with some twenty-five tubes applied over a large rodent ulcer of the face. Soon after their removal it was noticed that there were only twenty-four tubes in the package. Suffice it to say that after an anxious hunt all over the hospital it was concluded that the

tube had been carried off in the city ash-cart, and dumped into the vast heap on the outskirts of Baltimore. A sad little party journeyed out to the dump with an electroscope and began working somewhat vaguely over the vast area, with no result, until at last a faint response came in the slow dropping of the leaf of the instrument. A little further search brought to light some envelopes addressed to patients in the hospital. Then the hunt was gradually narrowed down by the electroscope until one area seemed quite responsive. This material was lifted into a discarded bath-tub, and was found quite active, the first bucketful of the waste responding vigorously; again, the

very first handful taken from this, too, showed increased activity, and here the radium was found! We felt like the woman in the Bible who rejoiced so over finding her lost coin, and we could scarcely restrain ourselves also from calling in our neighbors to rejoice with us.

The following account is in Thurstan Holland's own language:

"At the Liverpool Royal Infirmary, in February, 1914, a platinum tube containing 50 mgs. of radium was lost. At the time it was lost the radium—bought at £16 per milligramme—was worth £20 per milligramme, *i.e.*, £1000.

"The tubes had been fixed over a rodent ulcer on the face of a man in one of the wards. The next day on removing the dressings one of the tubes was missing. The man during the night had been allowed to go to the lavatory, and this rather complicated matters. When the loss was discovered the ward had been swept out, and all the refuse had been thrown into an ash-cart, which was full and on the point of being removed.

"Mr. Moor stopped the removal of the cart, and suggested that Professor Wilberforce—the Professor of Physics at the University—should be asked to come over and bring an electroscope to help find the radium.

"The patient, his bed, and all likely places in the ward were tested, with a negative result. The electroscope was then taken down to the court and placed on the edge of the ash-cart, when it slowly reacted, the leaves falling together. It seemed pretty clear from this that the radium must be in the ashes.

"Bucketfuls of ashes were then removed from the cart, and each one was tested

until one of them discharged the electroscope. Handful by handful the contents of this bucket were removed until the remainder in the bucket gave no reaction. In the last handful taken out the tube was found.

"C. THURSTAN HOLLAND."

All such experiences, and they have been many in our country, only go to show how much better it is to employ the emanation in our treatments. The loss of the emanation is equivalent to spilling a bucket of milk; the cow still remains to furnish more milk.

The Liverpool Workhouse Infirmary mentioned above, where Dr. Holland lost his radium, is the institution where Agnes Jones (1832-1868) laid down her life in the first introduction of trained nursing into a large pauper community, even worse than Philadelphia's old Blockley in its early evil days. Its 1300 inhabitants included the very off-scourings of a degenerate civilization, and was the place where the reeking wreckage of the alleys and the closes crept to die. To keep down fighting a policeman went through the wards every night. Here Mr. W. Rathbone, Liverpool's great philanthropist, in coöperation with Florence Nightingale, opened up a new field of philanthropic endeavor, and secured Agnes Jones, Florence Nightingale's favorite pupil, for the service to which she gave her devoted life. With a full knowledge of the fact that many noble women have since made great sacrifices in similar service, the question may yet well be raised whether any one has ever succeeded in coming up to the standard set by noble Agnes Jones, the pioneer.

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Original Articles

Observations of the Continued Use of Luminal in Individual Cases of Epilepsy

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AND

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the Insane, Danville, Pa.

Many contributions made on the subject of luminal in the treatment of epilepsy have well established the use of the drug in the treatment of this disease. The drug is now not only being used by the alienist and neurologist, but to a great extent by the general practitioner of medicine. That the drug controls to a definite degree the seizures, that the administration of the drug over short periods of time produces no untoward effects, and that a definite dosage has been established for these cases, are well-recognized facts.

The objects of the study of the cases herein cited were:

1. For the purpose of determining the effects on certain types of mental cases, whose postepileptic furor and confusional state have made them trying hospital problems.
2. To observe the effects of the long-continued use of the drug on epileptic seizures.
3. To observe the effects which might arise after long usage.
4. To observe the effects of the withdrawal of the drug.

Twelve cases were selected in the male and female wards for treatment. Our preliminary observations coincide practically with a number of writers as far as the reduction in the number of seizures, dosage, and absence of untoward effects are concerned. Five of these cases in the male department, however, were continued on the treatment and subsequent observations made for a period of nine months. The table shows the number of seizures occurring, in monthly periods, prior to administration of the drug, number of seizures during treatment, dosage used, and number of seizures occurring after the withdrawal of the drug.

Chart 1 represents a case of long standing and shows the convulsion curve prior to the administration of luminal, and a distinct decline of the curve during the first month's treatment under one and one-half ($1\frac{1}{2}$) grains dosage daily. During the second, third and fourth months convulsion curve ascends, but does not reach the peak. Under increased dosage curve declines, but again ascends. As the drug was withdrawn, nine convulsions were noted in nineteen

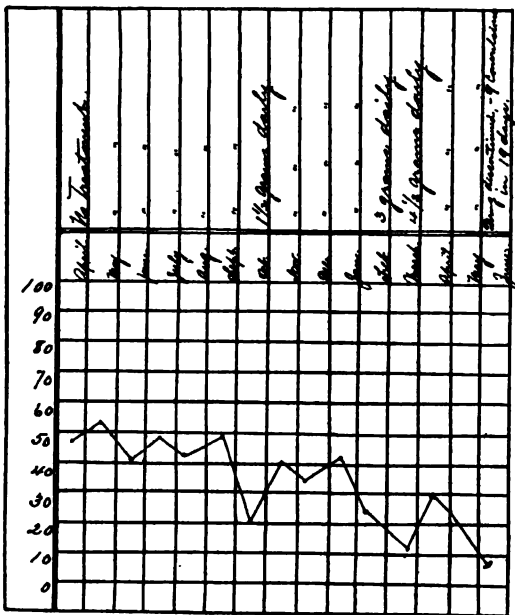


CHART 1.

days, at which time patient became markedly disturbed and further observations were not noted.

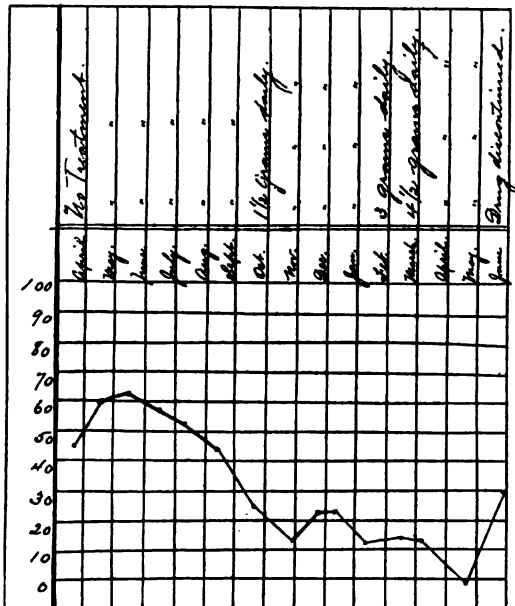


CHART 2.

Chart 2 represents a case with frequent seizures, confusion, and irritability preceding and following attack, and shows a curve prior to treatment, decided decline with the dosage of one and one-half ($1\frac{1}{2}$) grains, a secondary elevation and a secondary fall

on increased dosage, with marked ascent on the discontinuation of the drug. It is to be noted that the severity and irritability were very much less under luminal treatment.

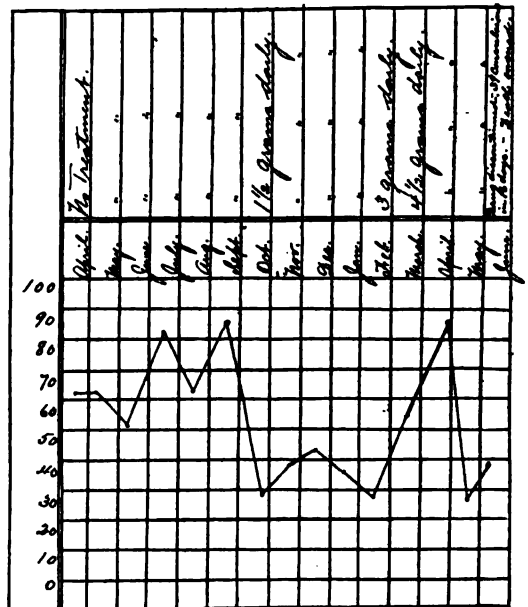


CHART 3.

Chart 3 represents a mild type having frequent seizures, many petit mal in nature. Convulsion curve shows decided decline on one and one-half ($1\frac{1}{2}$) grains dosage, secondary elevation, secondary decline with

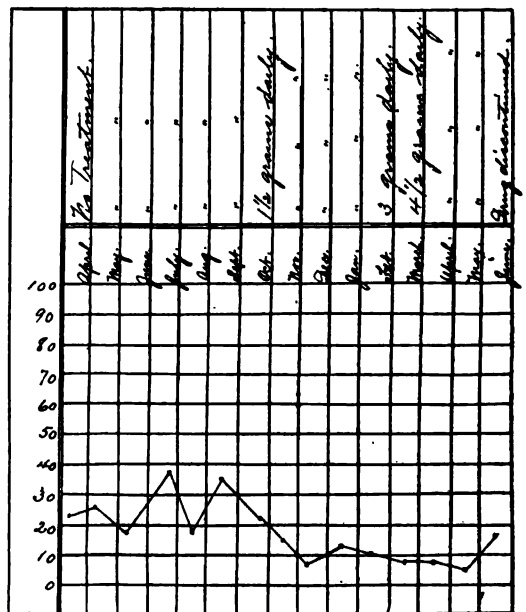


CHART 4.

increased doses, with a marked ascent and descent under the same dosage, and shows elevation on withdrawal of drug, thirty-nine convulsions having occurred in sixteen days. Patient was seized with status epilepticus and died.

Chart 4 represents a case with frequent and severe convulsions, preceded by irritability. Convulsion curve shows decided decline on initial doses, secondary elevation with a fall on increased doses, with a decided elevation on discontinuation of the drug. During treatment seizures not so severe and irritability lessened.

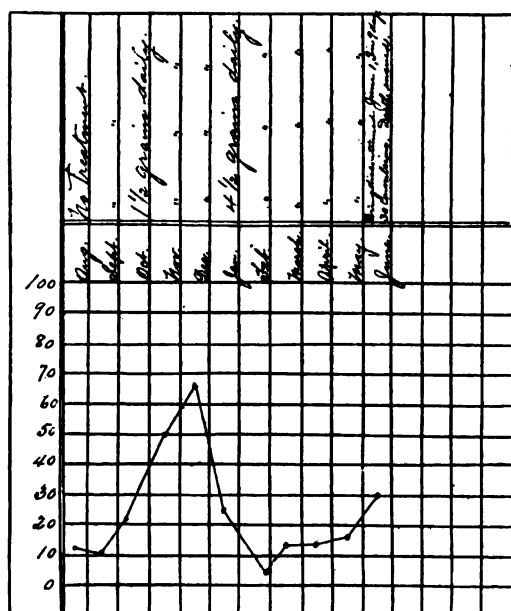


CHART 5.

Chart 5 represents a case of petit mal type, convulsion curve continuing to rise under treatment of one and one-half ($1\frac{1}{2}$) grain doses, with a decided decline on four

and one-half ($4\frac{1}{2}$) grains doses daily, with the usual secondary elevation and marked ascent on discontinuation of the drug. Patient was seized with status epilepticus and death ensued.

Although we have observed only five cases during a period of treatment which extends over a period of several months, we may arrive at the following conclusions:

1. That luminal in doses of one and one-half ($1\frac{1}{2}$) grains daily reduces the convulsion curve.

2. After a period of time the drug loses its effect and there is a secondary elevation of the convulsion curve.

3. Increased doses reduce again the convulsion curve, but there is a secondary elevation on increased doses, and a distinct elevation on the complete withdrawal of the drug. This is no doubt due to increased tolerance to drug and the lack of a curative effect.

4. In two of the cases, after withdrawal of the drug, seizures were severe; patients developed status epilepticus and died.

5. Luminal reduces the convulsion curve, but will not completely eliminate the convulsions.

6. Prolonged use of luminal is not free from danger, and withdrawal of the drug should be carried out with greatest care and precaution.

7. The degree of postepileptic confusion and furor was lessened in two cases.

8. Luminal offers temporary relief, but the value of its treatment in the custodial epileptic is doubtful, as established tolerance necessitates higher dosage, the continued use and withdrawal of same being associated with serious phenomena.



The Use of Acetylsalicylic Acid Locally After Tonsillectomy, and in Acute Pharyngitis

BY EDWARD P. HELLER, M.D.

[From the Clinic of Dr. John G. Sheldon, Kansas City, Mo.]

Since 1916 I have had the opportunity of observing the local effect of acetylsalicylic acid in nearly 1000 cases convalescent from tonsillectomy. The fact that its use is almost universally successful in relieving the annoying dysphagia, together with the fact that many of the nose and throat surgeons in Kansas City are employing the drug routinely after tonsillectomy, prompts me to record these few notes relative to its use.

In looking over a number of standard texts I have been unable to find reference to the local use of acetylsalicylic acid for any condition, and its use after tonsillectomy is not referred to in any of the literature to which I have access. I will make this exception to the foregoing statement, viz., in Hare's "Practical Therapeutics" and in Thornton's Pocket Medical Formulary the following prescription is to be found under "Tonsillitis:"

R Acidi acetylsalicylici, 4.00.

Sig.: Apply carefully to tonsils with dry cotton swab every 12 hours.

Indications: In rheumatic tonsillitis, the tonsils and nasopharynx should be cleansed with a solution of sodium bicarbonate before each application.

It was to this prescription that I attributed my own relief from dysphagia when, in 1916, I had my own tonsils removed, and for three days had tried every gargle and application in the pharmacy of the hospital in which I was then serving. Being unable to swallow the tablet of acetylsalicylic acid whole, I chewed it up and swallowed it in small pieces. The taste was not very disagreeable and the effect was amazing. I went immediately to the dinner table and ate comfortably for the first time in four days. Thereafter I took 1 to 3 decigrammes of the drug ten or fifteen minutes before each meal and had no further discomfort.

From that day to this I have carried the gospel to those who seem interested in the relief of their patients after tonsillectomy, and can count a number of locally prominent nose and throat surgeons among the converts. Many had known of the local effect of aspirin it is true, but most had not, and none had used it following tonsillectomy.

I must confess that I have never exactly followed Dr. Thornton's directions, but have given the acetylsalicylic acid alone in powdered form, on the tongue, or in water—about 3 decigrammes to one-fourth glass of water, as a gargle. It would appear that the efficacy of the drug is partly due to the mildly acid solution it makes with the saliva. This in turn causes a vasoconstriction and increase in the tonus of the damaged tissue of the pharynx, together with the intrinsic, analgesic effect of most drugs of this group, plus, later, the general systemic effect of acetylsalicylic acid, which is chiefly analgesic.

In vitro the addition of 3 decigrammes of sodium bicarbonate completely reverses the acid reaction of acetylsalicylic acid dissolved in saliva and causes a frothy alkaline mixture to result. In view of this fact and because of the excellent results obtained by administering it alone, I have never ordered a preliminary alkaline gargle, nor have I given an alkali with it to cases convalescing from tonsillectomy. For ordinary pharyngitis and simple acute tonsillitis I have thought at times that a powder of equal parts aspirin and sodium bicarbonate gave considerable relief when taken on the tongue.

Administration.—To patients convalescing from tonsillectomy, it is the practice to administer 1 to 3 decigrammes of the powdered drug on the tongue, on the evening of the first day, or about eight to

ten hours after the operation. They are then given the same dose ten or fifteen minutes before each meal for three to four days. Relief is almost universal, as I have stated—in fact, in the past eighteen months I recall only two patients who did not voluntarily state that they were relieved. Most patients are able to swallow comfortably immediately the powder has passed the oropharynx.

In patients with an idiosyncrasy to the drug, or in whom ingestion of the drug is contraindicated, a weak solution (3 decigrammes to 30 Cc. of water) is given as a gargle, and with practically the same effect as when the drug is swallowed. This fact

proves very conclusively that it is not the systemic effect that does the good.

In acute pharyngitis and simple acute tonsillitis, powders of 1 to 3 grains of the drug are prescribed every three or four hours to be taken on the tongue without water. Results are identical with those observed in postoperative tonsillectomies. In all cases the ordinary precautions are followed with respect to position, regulation of diet, and care of the bowels. In rare cases a mild gargle, such as weak Dobell's solution or 25-per-cent glycothymoline, is allowed as a mouth-wash between meals. Gargles are seldom prescribed, nor do they seem necessary.

Mechanical Aspects of Acquired Chronic Valvular Heart Disease*

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It may be possible that during the course of chronic valvular disease the rôle of the heart muscle is at times overshadowed by certain mechanical factors which result from the disturbance of anatomical relationships. Electrocardiograms of certain individuals with chronic valvular disease (especially in those before the age of forty) may reveal none of the characteristic alterations which are commonly thought to be indicative of gross muscular change, the only finding in many cases being a preponderance of one or other ventricle. Furthermore, autopsy findings in such cases do not always reveal sufficient damage to the myocardium to account for death on that basis alone. The attempt will be made to correlate clinical findings with possible disturbed anatomical relationships.

At the outset it is necessary briefly to consider the relationships of various parts

of the heart. It is suspended in the mediastinum largely by two important structures: (a) the pretracheal layer of the cervical fascia which descends into the chest, enveloping in its descent the thyroid gland, left innominate vein, the aortic arch, and finally fusing with parietal pericardium both anteriorly and posteriorly; (b) the left bronchus, over which the aortic arch is hooked.

The base of the heart is definitely fixed in the transverse position by other mediastinal structures. The left auricle is firmly enclosed in relatively small confines, being bounded posteriorly by the vertebral column, descending aorta, and esophagus, anterosuperiorly by the ascending aorta, pulmonary artery, and the left coronary artery, laterally by the pulmonary veins and hilus of each lung. The left auricular appendage projects anteriorly and to the left; it is in close relation to the pulmonary artery and overlaps the left coronary artery. The right auricle is fixed in the vertical plane by the superior and inferior caval

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veins, medially it is bounded by the ascending aorta, laterally it is in relation to the right phrenic nerve.

The ventricles are relatively mobile, being attached both to the auricles and great vessels arising from the base of the heart and bounded laterally by soft lung tissue, the left ventricle occupying the cardiac notch of the left lung. They are bounded anteriorly by the chest wall; enlargement anteriorly is thus limited, and in the presence of marked hypertrophy rotation takes place.

When the ventricles alone are enlarged, very few structural symptoms—*i.e.*, those depending for their production upon disturbed anatomical relationships—are present. On the other hand, when disturbances are present in the auricles, pressure, direct or indirect, may disturb the function of the surrounding structures and give rise to many of the signs and symptoms found in chronic valvular disease.

Disease of Aortic Valve.—Disease of the aortic valve is usually well established before discovery, possibly because the left ventricle may undergo marked hypertrophy without causing pressure signs, as the left lung and chest wall are the only structures pressed upon and the chest wall is avoided by rotation. Aortic valve disease in absence of marked damage to kidneys or other vital organs is a comparatively benign condition. Death by heart failure usually results from the association of mitral disease, fibrillation, or damage in other organs, the same etiological factors being responsible. The first signs of aortic insufficiency may be dyspnea, pallor, violent throbbing in the neck, and attacks of precordial pain on exertion. Dyspnea and pallor may be due to the decreased volume output of left ventricle and the physiological increase of respiration as the result. A diminished blood supply to the respiratory center may be an additional factor in the production of dyspnea.¹ According to Eppinger and Schiller² acidosis may be considered an unlikely factor in the absence of renal or other changes. Headache, dizziness, ringing in the ears, throbbing in the neck, and

mental symptoms are commonly thought to be due to cerebral anemia.

Pain in Aortic Disease.—It is a well-known clinical truth that pain is much more frequent in aortic than in mitral disease. The greater pain in aortic disease may possibly be due to the fact that both coronary arteries are involved, as they arise from the aortic sinuses which are in close relationship with the aortic valve itself. Pain may be due to the sudden collapse of the coronaries and vessel-wall spasm, or the pain may be due to overdistention of coronaries causing pressure upon the accompanying nerves. The process is considered by some to be the same as met with in any smooth-muscle spasm, *e.g.*, biliary or renal colic, the sympathetic innervation passing reflexly through cord, the visceral fibers forming sinapses in the various parts of the gray matter of each segment.

Dropsy is not found in uncomplicated aortic disease as there is no anatomical reason for its occurrence. When it occurs in absence of cardiac enlargement Mackenzie¹ believes it is probably not of cardiac origin. He also doubts the existence of urinary signs of heart failure in the absence of dilatation: there is no anatomical basis for such manifestations.

Cough, hemoptysis, liver enlargement and general anasarca do not occur except with coincident mitral involvement, which is relative or due to actual damage to the valve. At times the presence of auricular fibrillation with aortic insufficiency may obscure the mitral valve element.

Aortic Stenosis.—When occurring without marked insufficiency this lesion is quite benign. There may be no symptoms for many years. The signs and symptoms commonly considered to be indicative of heart failure are usually due to the presence of other disorders, as the only mechanical influence may be a hypertrophied left ventricle which develops slowly and is not associated with great dilatation unless marked insufficiency also be present. This hypertrophy eventually gives way to extreme dilatation, resulting in relative mitral incompetency with its sequelæ.

When hypertrophy and dilatation of the left ventricle have reached a certain stage in aortic disease it is well known that the left auricle becomes involved. This has been commonly accepted as a classical example of so-called back pressure. As was pointed out previously, the left coronary artery is in very close relationship to the left auricle. It is reasonable to think that pressure is made upon this vessel, which supplies the heart muscle itself. May not the further dilatation and damage of the heart muscle be due directly to this impairment of nutrition? The acceptance of such a factor would do much to clear up the cause of progressive muscular damage, the myocardial changes being secondary to a mechanical condition whose progress cannot be stopped after a certain amount of damage has been done—i.e., after the left ventricle becomes large enough to cause pressure on the left auricle. It is realized that the concomitant valvular and muscular changes may be due to the same etiological factor: nevertheless it is believed that there are many instances in which the muscle changes may be very much aggravated by definite mechanical conditions and that in such cases the rôle of the myocardium is secondary.

Mitral Stenosis.—Patients having mitral stenosis often show a much more varied symptomatology and many more physical signs than patients with uncomplicated aortic disease because involvement of the auricles usually is more extensive and consequently the variations in mechanics from the normal are greater.

In mitral stenosis the left ventricle is small, but the enlargement of the left auricle is one of the principal changes. The musculature of the auricle is comparatively thin: marked hypertrophy does not occur, but dilatation rapidly takes place after increased intra-auricular pressure, and without doubt the mechanical influences overshadow the importance of the heart muscle in many instances. A great many pressure symptoms may be assigned to enlargement of the left auricle.

(a) Pressure on left pulmonary veins may produce left-sided pleural effusion.

(b) Marked enlargement of left auricle may cause narrowing of the four pulmonary veins, producing bilateral pleural effusion.

(c) Mechanical damming back of blood into the pulmonary veins may cause congestion of the lungs and hemoptysis.

(d) Pressure on the coronary arteries interferes with the nutrition of heart muscle itself, which explains the more rapid progress of mitral stenosis as compared to mitral insufficiency.

(e) Pressure on the accompanying nerves of the left coronary artery, which are derived from the superficial and deep cardiac plexuses, may conceivably give rise to a sense of oppression and vague pain over the precordium and stitch-like pains in the region of the apex.

(f) Pressure on the left recurrent laryngeal nerve may cause aphonia.*

(g) Pressure on bifurcation of trachea may cause brassy cough.

(h) Pressure on esophagus may cause dysphagia.

(i) Pressure on phrenic nerve may cause hiccough.

General anasarca due to venous engorgement is rare because in mitral stenosis with enlarged left auricle the inferior vena cava is not interfered with. Where, however, a combined lesion is present enlargement of the right ventricle may result from back pressure into the pulmonary arteries and tricuspid insufficiency may develop; dilatation of the right auricle may occur with subsequent damming back of blood into the great veins, with enlargement of the liver, followed by ascites. The enlarged liver precedes the ascites because the hepatic veins situated closer to the heart first become engorged, and the liver becomes the reservoir of heart before there can be any demonstrable ascites.

Where the right ventricle is enlarged there may be mechanical displacement of the left ventricle further to the left, and the right auricle rotates further to the right

at the same time. This may cause constriction of the inferior vena cava at its entrance to the right auricle, with consequent water-logging of the parts drained by this large vessel.

Right-sided pleural effusion may occur in the presence of enlarged right heart owing to the following mechanical factors:

(a) Heart is enlarged in the transverse plane with a pulling down of the superior vena cava, which thus constricts the vena azygos major as it loops over the right bronchus.⁴

(b) By direct pressure of the right heart on the right lung root and indirectly pinching the vena azygos major, as it curves over the right bronchus to enter the superior vena cava.^{5,6}

(c) The enlarged right heart may make pressure on the left auricle and the lower right pulmonary vein, which is the most anterior structure of the right lung root.^{7,8}

Mitral Insufficiency.—In certain stages of mitral insufficiency the left ventricle is enlarged less than the right ventricle and the size of the left auricle is practically unchanged. This valvular lesion is commonly recognized as having the least unfavorable prognosis. This is possibly due to the fact that mechanical changes are very small in this type. Dyspnea on exertion may be due to the general lack of oxygenation of blood during increased effort, the volume of output at each beat being smaller than normal. May not the increased respiration be a physiological attempt to bring about better aeration? When decompensation occurs the signs and symptoms may well be explained on the basis of back pressure.

Pain is rare in mitral insufficiency unaccompanied by marked stenosis because there may be very little change in the left auricle, and therefore no pressure on the left coronary artery and its accompanying nerves.

Auricular Fibrillation and Mitral Disease.—It is very well known that auricular fibrillation is very commonly found in association with mitral disease. In this disturbance of mechanism the pace-maker does not function. This structure is embedded

in the sulcus terminalis, which lies upon the posterolateral surface of the right auricle passing from the superior to the inferior vena cava, and in direct relation to the left auricle and the orifices of both right pulmonary veins. May not the purely mechanical factors of pressure at times have a certain part to play in the production of this disturbance of mechanism?

Value of X-ray Findings.—The foregoing anatomical and clinical considerations appear to be corroborated by fluoroscopic findings in living patients as summarized from the work of Vaquez and Bordet.⁹

According to these investigators the image of the normal heart in the frontal position is as follows: Right ventricle occupies greater part of frontal aspect. It is bounded above and at right by the auriculo-ventricular groove which separates it from the right auricle, which constitutes the upper two-thirds. On the left the anterior interventricular groove bounds on the outside a narrow band of the left ventricle from the base to the apex. At the base the aorta and pulmonary artery are present. Normally the structures on the right are as follows: In the second interspace, ascending aorta and superior vena cava; in third interspace, right auricle; in fourth interspace, right ventricle. On the left in first interspace, arch of aorta; in second interspace, pulmonary artery, below which is left auricle; in third, fourth and fifth interspaces, the left ventricle.

In aortic incompetency without serious decompensation, fluoroscopic examination shows that the shadow of the heart occupies a somewhat median position and that the apex, which is lowered, is pushed only slightly outward. Contour of the left ventricle is elongated, convex, not exaggerated. Right contour is normal. The longitudinal diameter exceeds the normal and the horizontal diameter is decidedly less. This is the picture without involvement of other cavities. Sometimes the hypertrophy of the left ventricle is very slight. On the contrary, many cases of aortic insufficiency however well compensated are accompanied by considerable

ventricular hypertrophy. As has been stated previously, the combination of aortic insufficiency and mitral stenosis is more serious than the presence of aortic insufficiency alone. The fluoroscope renders valuable assistance in determining whether a mitral lesion is present, as the left auricle is usually normal in aortic insufficiency alone, but is always increased in mitral stenosis of a moderate degree.

In aortic stenosis the fluoroscopic findings are somewhat similar to those in aortic incompetency, and it is to be remembered that if no lesion is present in the aorta there may be no signs of cardiac insufficiency.

Radiograms of mitral insufficiency without any marked circulatory disturbance resemble somewhat the normal horizontal heart. Development is exaggerated on the right. Contour of the left ventricle is normal. The apex is pushed outward, is rather pointed, and not lowered. The transverse enlargement of the heart is due to development of the right cavities. Left ventricle is enlarged less than the right. The left auricle may not appear to be changed. Ventricles are accentuated when mitral insufficiency is complicated, as, for instance, if fibrillation be present, transverse enlargement may be considerable.

In mitral stenosis radiograms show left median aorta plus, especially in the portion corresponding to the left auricle. The left ventricular outline is of slight dimension. The convexity is not so marked as in the normal. The apex takes on a pointed appearance. The right contour is very noticeable beyond right edge of sternum. The inferior vena cava is often more visible than in the normal. In the normal, left outline is greater than right, whereas in slight mitral stenosis the left but slightly exceeds, equals, or is even less than the right outline. Longitudinal diameter is usually exaggerated. Horizontal diameter is always much less than longitudinal. The heart is lowered and at the same time undergoes displacement from right to left, from behind forward, so that the right cavities are slightly raised toward the sternum, and the right curve of the heart must

necessarily be raised in the upper part to the level of the large vessels as well as in the diaphragmatic position and shows an exaggerated development outside of the sternum. Thus in mitral stenosis the heart undergoes a slight downward displacement, a movement downward which forces the apex below the normal position, and a seesaw movement which pushes the right auricle to the right without a real enlargement of that cavity. Enlargement of the left auricle is one of the principal changes in mitral stenosis, and the auricular appendage is compressed by the hypertrophied auricle. The lowering of the heart puts tension on the vessels. The outline of the pulmonary artery is more rectilinear. The underdevelopment of the left ventricle makes projection of pulmonary artery and left ventricle more apparent. When the left auricle is dilated or hypertrophied the shadow approaches or merges into that of the vertebral column.

The Value of Electrocardiograms.—Electrocardiograms in the cases under consideration are of value chiefly from a negative standpoint. The assumption of a predominating mechanical influence in the production of decompensation may be more safely made when the tracing shows no evidence of the changes commonly regarded as indicative of gross muscular damage. Variations in height and width of the P wave, especially when associated with notching, are considered to be indicative of changes in the auricle. In these cases the electrocardiogram may be practically normal with the exception of preponderance of one ventricle or the other, and a variation of the P wave if mitral disease be present; in our present state of knowledge neither of these changes is regarded as indicating severe myocardial damage. When, however, gross defects, such as branch bundle lesions, are found, it is apparent that the mechanical aspect is secondary in importance.

Aid in Prognosis.—In prognosis we can be very greatly assisted by considering the mechanical aspects along with damage to the myocardium. If evidences of both be present, prognosis is necessarily more seri-

ous. If the patient be suffering, however, from an uncomplicated aortic regurgitation, and if it is found that there is only moderate hypertrophy of the left ventricle, a brighter outlook can be promised. If the lesion is found to be a mitral insufficiency without a marked accompanying stenosis the best prognosis in any of the chronic valvular lesions may be given with considerable assurance. When the late evidences of mechanical pressure are present, as, for instance, edema of the extremities in a patient who is primarily suffering from mitral stenosis, we can be fairly certain that the end is not far removed. The same holds true in cases in which the lesion was primarily aortic insufficiency, as the anatomical explanations show that this sign is found only in advanced cases.

In considering prognosis of chronic valvular lesions it must be remembered, however, that 60 per cent or more of the patients who show the extreme signs of decompensation and irregular pulse have auricular fibrillation, a condition in which during the untreated stage we have a very inefficient mass movement of blood. When the ventricles are slowed many of the signs and symptoms disappear very quickly.

In many instances a patient having mitral stenosis and decompensation without the presence of auricular fibrillation may not respond to treatment nearly so promptly nor so thoroughly as a patient having mitral stenosis and auricular fibrillation. The question naturally arises as to the mechanical differences between fibrillating auricles and those having a sequential diastole and systole. It would be confirmatory of the importance of pressure in the auricular region if it were found that, the rate of the ventricles not being excessive, the auricles during fibrillation have a somewhat smaller volume than during certain phases of the ordinary auricular cycle. So far as known no observations along these lines have been made.

Compensatory Postures.—Patients having considerable enlargements of the various chambers of the heart assume various postures in an attempt to utilize every avail-

able bit of intrathoracic space. Some of them are definitely more comfortable in the sitting posture because the abdominal contents are compressed, the diaphragm is pushed up, and the heart assumes a more horizontal angle; some secure additional space by leaning forward on abducted elbows; some choose lying on one side in preference to the other, very often extending the homolateral arm—the head and chest may or may not be elevated at the same time; some find comfort only when prone; some beg to be allowed to stand upright to get a few moments' relief. After a patient has found that he is more comfortable in one position than in another he will maintain it as long as possible.

In patients with protracted courses pressure sores may be seen in unusual regions—for example, over the patellæ: in such instances one is almost positive that mechanical embarrassment overshadows the rôle of the heart muscle during a great part of the terminal stage.

Suggestions for Treatment Based upon Mechanical Considerations.—When the patient's optimum position has been found he will assume it of his own accord while rational and awake, and it will be found that he can fall asleep only in the same position. If delirious or asleep he may alter his position and invariably becomes very much more uncomfortable; therefore delirious and sleeping patients should be maintained in the optimum position by propping them with pillows (due consideration must, however, be given to the possibility of hypostasis of the lungs).

It is believed that many attacks of nocturnal dyspnea, precordial pain, cough, palpitation, etc., are due to a change in position while asleep, especially in those patients who do not have similar complaints during the day.

Patients with a degree of compensation which permits moderate exertion should be instructed to assume their optimum position immediately after any fatiguing effort, as they obtain relief more quickly than if they are left to shift for themselves. By this procedure the intervals of possible mechan-

ical embarrassment to the heart muscle may be distinctly shortened.

My observations on the influence of various postures are naturally far from complete as the possible combinations of mechanical disturbances are very numerous, yet in certain instances it has been possible to make a tentative diagnosis merely by observing the position of the patient or by asking him in which position he found himself (a) immediately upon awakening from a refreshing sleep, or (b) immediately after being awakened by dyspnea, palpitation, precordial pain, or cough.

COMMENT.

If it be true that in certain patients with chronic valvular heart disease the ultimate outcome depends upon mechanical disturbances which inevitably wear out heart muscle and cause lethal changes in other organs, it would seem reasonable that an attempt should be made to diminish such mechanical disturbances. Cardiac decompression by surgical procedures may possibly be of value when it appears certain that mechanical embarrassment outweighs the rôle of the heart muscle. Does nature

provide us with a portion of the heart uncovered by lung as a reserve against increased pressure? Could this reserve be increased by removal of the bony framework over the superficial cardiac area? Does nature deform the chest of a child with chronic valvular heart disease to relieve cardiac pressure, or is the bony framework in its normal condition an additional safeguard? These appear to be definite problems awaiting solution, and the only excuse for mentioning them while my work is in an embryonic state is to enlist the aid of more experienced clinicians and more expert laboratory workers in solving this complex matter.

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The Vitamines and Their Relationship to Health and Disease¹

How to Determine when Vitamines are Present

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(Continued from November number)

We referred in the preceding article to the three generally recognized types of vitamins as the fat-soluble A, the water-soluble B, and the water-soluble C. At this point it may be well to elaborate further upon the classification of the vitamins in order to avoid undue confusion in subsequent statements.

POSSIBLY FIVE VITAMINES INSTEAD OF THREE.

First, with reference to the fat-soluble A there has been much discussion as to whether both the ophthalmic and the rachitic conditions were brought about from certain dietary deficiencies by a lack of this particular vitamin. Mellanby thought that these diseases had a common etiology, but Hess and more recently McCollum are of the opinion that each of the deficiency dis-

¹From the Medical Research Department, Parke, Davis & Company.

²THE THERAPEUTIC GAZETTE, November, 1931.

eases is more than probably due in part at least to a specific fat-soluble vitamine—that is, there are two vitamines of this type instead of one, the antiophthalmic and anti-rachitic.

Second, with reference to water-soluble B vitamine, Williams, Bachman, Eddy and others considered that the vitamine which appears to be essential for the proper multiplication of the yeast cell was the water-soluble B. On the other hand, Emmett and Stockholm published results which indicated that this yeast stimulus was apparently different from the water-soluble B vitamine. Funk and Dubin have recently confirmed these findings, and they have proposed to designate this the water-soluble vitamine D. Furthermore, Emmett and Luros are of the opinion that the water-soluble B proper may in reality include two vitamines, the antineuritic and the water-soluble growth-promoting factors.

In view of these statements, we should consider not only the three vitamines that have been generally recognized, but also bear in mind the *possibility* that there are two or three additional ones. While this broader scope of the subject may be confusing, yet in some instances it may help to clarify certain phrases which pertain to the etiology of some of the deficiency diseases.

VITAMINES IN FOODS.

Now, from what we have previously stated,⁸ it would appear that one cannot as yet be sure when a food or food product does or does not contain one or more of the recognized types of vitamines. It does not follow, however, that in consuming the ordinary food products the average family under our normal economic conditions is in any immediate danger of becoming a victim of the classical dietary deficiency diseases, scurvy and beriberi. Except in war and other extreme exigencies these two diseases need not concern us, but as we shall see other pathological conditions may come about.

True, there has been and is a marked tendency on the part of the manufacturer

to refine many of the food products to such a degree that the vitamines are either partially or totally removed from the food when it is finally prepared for consumption. This is due, however, in the main to the fact that the public, with little if any conception of actual food values, demands what is pleasing to the eye and palate,⁹ and also what can be prepared for the table with the minimum expenditure of time and money. The result is that many foods are extremely deficient in these principles. We should therefore concern ourselves with this unfortunate condition of affairs.

Yet, with the variety of foods that are available for the average American table, it is possible to adjust the selection of the culinary articles so that the vitamines as well as the other nutrients can be adequately supplied to those individuals who are in the average state of health. In this connection it is safe to say that, in the long run, the more nearly a food approaches its natural and fresh state the richer it will be in the vitamine or vitamines that it should contain.

VITAMINES FOR THE SICK.

There is a large group of individuals, however, which is made up of the truly pathological and also of the "border-line" type of patients. The majority of these show definite signs of having either a poor or a perverted appetite and also abnormal digestive and low assimilative powers. As a result, it will always be difficult to maintain a variety of foods that will amply fulfil the nutritional requirements which these cases often demand. In other words, there are many instances where it is fundamentally important that an adequate quantity of vitamines should be supplied in an *available* form, and yet it is equally important that the weakened or sluggish digestive tract of the patients should not be overtaxed from using foods that will disagree with them.

CHEMICAL AND BIOLOGICAL TESTS FOR VITAMINES.

Since it is comparatively easy, from the compilation of data that has been made, to select and prepare foods that contain the

other essential nutritive factors—proteins, fats, carbohydrates, and mineral salts—the question that should then be considered is, How can one determine when a substance contains the vitamins and how can one distinguish the several types? Unfortunately there are no chemical tests which can be relied upon to aid us to advantage in this work. The colorimetric chemical tests that have been suggested for the water-soluble B and C vitamins have proven to be of little or no value.

The uninitiated would naturally think that since chemistry can detect so many things, it would be relatively easy to make at least a qualitative test for these substances. This will undoubtedly come to be true in due time—just as soon perhaps as we begin to learn something definite as to the chemical structure and nature of one of the vitamins. Many forget or do not realize that there is a large number of substances which a chemist is not able to make synthetically, but yet he may prepare them by precipitation, etc., although he does not know their exact chemical composition. Take pepsin, for example: we know that it is an enzyme, that it has certain properties, but still we cannot define it chemically. Except for the biochemical tests as a digestive agent, we cannot distinguish the enzymic property of pepsin from some inert organic meat by-product.

Just so with the vitamins, we are obliged to resort to biologic methods which in this case involve the actual feeding of animals under carefully controlled conditions, and then determine what takes place when the substances are fed. *The practical importance and significance of these tests are so great that every physician, dietician and nurse should be fairly familiar with them, and for this reason the method of procedure and the general symptoms produced in the animals receiving the deficiency diets will be stated:*

TEST FOR FAT-SOLUBLE A VITAMINE.

In testing for the fat-soluble A type of vitamin, the albino rat appears to be the most adaptable animal we have. Prefer-

ably very young rats are employed, that is, rats ranging from 25 to 30 days old. They are generally fed a prepared diet that contains all the essential nutritional factors except this particular vitamin. In due course of time, about eight to twelve weeks, the rat begins to show the following signs of deficiency: the rate of growth becomes slower and may even cease entirely, and then be followed by a loss in weight; the coat of hair becomes moist, rough, and wiry, and the skin may show signs of xerosis; at times diarrhea occurs, and if the animal is allowed to continue on this diet the eyes become sensitive to light, and weak, as shown by the tendency to squint and by an excess of tears; later there is an edema around the eyes and the lacrimal glands function poorly. The conjunctiva then becomes involved and gradually appears dull. As time goes on, what seems to be a secondary infection generally sets in and serious results to the sight may occur. This is manifested by pus formation, a protruding of the eye, an involvement of the retina, and even rupture of the eyeball, unless a change is incorporated earlier in the diet.

These are definite symptoms of the lack of this vitamin. If the food or extract containing the missing vitamin is now fed to the rat, when it reaches a condition not too far advanced, there will be an early and fairly rapid recovery to normal. In case the food or extract used in the test is very low or entirely devoid of the fat-soluble vitamin, the ophthalmic condition will grow worse and the animal will become totally blind and later die.

Under these conditions of stress the rat is very susceptible to respiratory infection—that is, the resistance of the animal is lowered, due primarily to a lack of this type of vitamin. Secondly, due to the atrophy of the lacrimal glands of the eye, there is in turn a retardation of the mechanical flushing of the nasal passages. This permits bacteria to lodge and grow. The result then seems to be a gradual extension of infection into the various passageways—nares, tonsils, and bronchi.

TEST FOR THE ANTIRACHITIC FAT-SOLUBLE VITAMINE.

In this case either the albino rat or young puppies are used. The diet fed is lacking in this vitamine. The effect produced is shown by the retardation of the calcification of the bony structures, which manifests itself as rickets and dental caries. In the first instance, if dogs are employed, the leg bones are soft and gradually bend out of shape and the joints become enlarged; while in the case of rats growth soon ceases, the coat of hair becomes rough, and sections of rib bones show the pathological condition of decalcification. In the second instance the enamel of the teeth gradually deteriorates in dogs; while in rats the teeth become dull, chalky white, and wear off easily. If the diet is corrected before these conditions have gone too far, calcification soon starts and the structures gradually become normal.

TEST FOR THE WATER-SOLUBLE ANTI-NEURITIC VITAMINE.

The animals employed in making this test are generally pigeons, but sometimes squabs, chicks and chickens are used. Fowl are especially well adapted for making this specific test.

The general syndrome due to a lack of this factor with pigeons is first a decided loss in weight, then a decrease in appetite, followed by a further loss in body weight. Concurrent with these changes, the feathers become ruffled; the skin dries and tends to scale; the bile accumulates in the duct, and later the intestinal tract shows evidences of becoming saturated with bile; the animal appears drowsy and stupid, does not fly or sit on the perch, but stands huddled; the pupil of the eye contracts and the iris appears very prominent; the red blood-cell count is below normal; respiration is labored; and in the late stage of the disease the body temperature becomes subnormal. In some cases the birds have paralysis of the legs; while in about as many other instances the head is drawn back in a very

characteristic manner, the legs remain normal, but the toes are drawn up. When the animals develop this latter condition they generally have frequent spasmodic attacks, turning over and over backwards.

Internally, some of the changes that take place are: a lessening of the flow of gastric and pancreatic secretions; an alteration in the endocrine glands with an enlargement of the adrenals and an atrophy of the thymus; an atrophied heart and hydropericardium; the testes and ovaries are atrophied with a tendency toward a lack of spermatogenesis and sterility; the lining of the crop becomes roughened and very irregular compared with that of the normal animal; the intestinal condition indicates in many instances marked congestion; there is generally an accumulation of gas in the intestines; the spleen, pancreas and kidneys are light-colored and anemic; and practically all the adipose tissue or body fat is absorbed.

Some of these changes are the result in part of the effects of inanition from which the birds suffer to a greater or less extent. This, however, is due directly to the lack of the vitamine under consideration, since it has an apparent effect upon the appetite.

Now, when the pigeon reaches the low ebb where, after a period of feeding lasting about 21 to 30 days, it passes into the state when partial paralysis and head retraction are evident, the substance to be tested is given the animal by forced feeding or injected subcutaneously. If the vitamine is present in reasonable amount, the bird will respond to treatment and be able to relax and control its muscular movements in the course of a few hours. Then, if the pigeon is given further treatment and the proper food, it will gradually regain its loss in weight and become normal. This procedure is what is called the "curative" test.

Some prefer the prophylactic test, which consists in feeding pigeons or chickens from the beginning the substance under examination, along with the proper amount of the other essential dietary constituents. Feeding a corresponding group of birds at the same time on a ration that will produce

the pathological condition, and also one on a ration that will produce normal results, it is possible, by comparing the three groups, to draw fairly definite deductions regarding the value of the material under examination. This test requires eight to ten weeks.

TEST FOR THE WATER-SOLUBLE B VITAMINE.

As was stated above, there is some doubt as to whether the water-soluble B vitamine is the same as the antineuritic factor. In making the specific test for the water-soluble B it has been the custom to employ very young albino rats. These animals are either fed a balanced ration, containing the substances to be tested, or they are first given a synthetic ration which is complete excepting for the absence of this vitamine. In the latter case, when the animal shows the usual symptoms resulting from the absence of the vitamine, it is treated with the substance in question, and the succeeding results are then observed and noted as in the case of the pigeon.

The withdrawal of this water-soluble B from an otherwise balanced ration produces results in young albino rats which are very similar in many ways to those brought about in the pigeon, but different in other respects. Thus, the initial loss in weight is not so evident, for in many instances the animal continues to grow for two or three weeks, but somewhat less rapidly than it would on the normal ration. Then there is a gradual decrease in appetite and a cessation of growth, as measured by weight, followed by a further loss in weight and a decline in physical condition.

During this entire time the animal, in marked contrast to the pigeon, does not become drowsy, stupid, and sluggish, but it continues to be very active. The coat of hair often appears moth-eaten and very thin. The eyes, however, remain perfectly normal, whereas with the lack of the fat-soluble vitamine it will be recalled that the eyes are affected in a very definite manner. Further, there is no involvement in respect to decalcification of the bones or teeth.

Also, these animals are not nearly so susceptible to respiratory infections as are those on a lack of the fat-soluble factors.

These rats do show, however, some similarity to the pigeons in respect to the polyneuritic condition, for as the rat loses weight and becomes weaker it finally reaches a stage during this asthenic period where it suddenly lacks control of its limbs—a sort of creeping paralysis takes effect. The animal often endeavors to stand and move forward in a given direction. In the attempt, it takes the position of being on stilts, as it were, and then with the head swaying about in all directions it finally falls over with a sort of tetany. In this position the posterior limbs are stretched out rigid while the anterior limbs move about in an apparent effort to hold on to something. Thus the feet and toes of the forelegs seem to be much more under control than those of the hind legs. Pricking the posterior feet with a needle shows that the sensory nerves are still functioning while the motor nerves are not. Occasionally the forefeet become affected, but in the large majority of instances that we have dealt with the attack begins with the left hind leg, and then it gradually involves the right hind one. In this condition the tail is stretched out taut, but yet the rat can move it about, for in an attempt to pull itself ahead with its forefeet the tail serves as a sort of rudder.

In several respects, while in this condition, the rat is again very different from the polyneuritic pigeon. Thus it seems to be highly sensitive and nervous. It tries to be in action and alert, while the bird at the stage where the head is retracted seems to be perfectly helpless and almost unconscious, and when it is in the relaxed state it generally remains quiet, stupid, sluggish, and entirely indifferent to its surroundings. On the other hand, the relaxed bird may go into the spasmodic condition as a result of handling.

Treatment of the sick rat at this stage generally brings about very definite and sharp response, so that in six to ten hours the animal after one treatment of a concen-

trated vitamine B preparation often has full control of itself, will be eating its food, and show very little of the previous symptoms of a lack of muscular control. It soon begins to gain rapidly in weight and gradually returns to the normal condition.

Upon autopsy the pathological rat shows almost identically the same picture as the polyneuritic pigeon. There is one very noticeable difference in that the pigeon shows a distinct accumulation of bile, whereas the rat does not.

In working with young chicks about two to three weeks old, Miss Peacock and I have very recently found that they are easily adaptable to this test if the diet is properly adjusted. In fact, the chicks appear to be much superior in some respects to young rats or squabs. It is possible to work with large numbers from one hatching and eliminate much of the variation that often exists between pigeons, squabs, and rats; and further, the length of the test is shortened very appreciably. The chicks are so sensitive and susceptible to the absence of this vitamine that the prophylactic test is possibly preferable to the curative one.

TEST FOR THE WATER-SOLUBLE C VITAMINE (ANTISCORBUTIC).

While we are interested to only a very minor degree in advanced scurvy, this vitamine has a very definite relation to many conditions which come under the subacute or latent scurvy classification. Therefore it is of interest to know how one must proceed to determine whether or not this nutritive factor is present.

Instead of white rats, pigeons, or chicks, guinea-pigs are employed. The prophylactic test is generally the most satisfactory. The young pigs are first weighed, then divided into three groups, one of which is fed a normal diet, another a deficient diet, and the third group the deficient diet plus the substance to be tested. If a concentrated product is being examined it is preferable to treat the animals with definite amounts of it at regular intervals, rather than to mix

it with the food. In this way one can be sure that an actual quantity of the substance has really been consumed. Under definite conditions with respect to body weight, dosage, time, etc., Le Mar considers it is possible to obtain relatively quantitative results.

The syndrome in cases where the guinea-pig develops scurvy begins with a loss of appetite and weight. The coat of hair becomes rough, the animal appears less active, the eyes are sunken, and the pig shows definite signs of sluggishness and asthenia. After a time the joints become so tender that when one presses them, even gently, the pig squeals from pain. If the animal survives for a few weeks the gums recede and often bleed, the teeth become loose, and in some instances they may even fall out. Further, from the work of Zilva and Wells and also Howe the pulp of the teeth shows a decided degeneration.

Upon autopsy there may be evidences of hemorrhages in different parts, but most commonly the knees show first, then the elbows, and in very advanced cases there is marked congestion of the intestines. The adrenal glands are hypertrophied and the testes or ovaries are atrophied. The bony structure becomes so soft at times that it is comparatively easy to pierce it with a sharp instrument. The costochondral joints of the ribs become enlarged and the "rosary" is formed. The kidneys and bladder are often affected, and the urine may become very cloudy. The intestinal tract is generally distended.

On the whole the indications for scurvy are not as clearly defined and differentiated as they are with some of the other tests cited. It is often difficult to make a positive diagnosis as to whether death was due to scurvy or starvation, or other complications. Thus, guinea-pigs when placed upon a scurvy diet soon show definite signs of failure and lowered resistance, so that they become an easy prey to infections of various sorts, especially pneumonia. For this reason it is almost imperative to maintain the temperature of the room at about 80° C.

and avoid any draft, and use every precaution possible.

TEST FOR THE WATER-SOLUBLE VITAMINE D.

In cases where it is desired to determine whether this vitamine is present, it is necessary to employ synthetic media and study the relative rate of growth of the yeast cell or certain types of bacteria. Using a control medium and adding to another lot of this same medium some of the unknown substance in extracted form, one can determine under definite conditions approximately the difference in the amount of growth that has taken place over a period of time. If one can eliminate the toxic or inhibiting factors, the results are almost quantitative. It is necessary to employ the same strain of yeast throughout and to keep the stock cultures in prime condition, otherwise the results may be very misleading. Further, great precautions should be taken to not alter appreciably the hydrogen ion concentration of the medium upon adding the extract.

SUMMARY.

From the foregoing statements as to the methods that need to be employed to determine the presence or absence of any one of the vitamins in a food or food product, it is evident that the procedure is one which calls for more than ordinary precautions. These tests require much time and careful supervision throughout. Comparing them, one with another, it seems that each has its own specific purpose and that in no two cases can one say that the tests are, strictly speaking, duplicates. That is, it would seem that one vitamine cannot replace another, but that all are needed for normal cellular metabolism and health.

[In the next paper we shall discuss the pathology of the animal in relation to similar and related clinical conditions in the infant and adult human, and show wherein the so-called vitamins play an important rôle in the physiologic economy.]

(To be concluded.)

Spinal Puncture in Diagnosis and Treatment.

BASTRON, in the *American Journal of Syphilis* for July, 1921, states that very little of positive value can be said about the curative influence of spinal drainage in neurosyphilis. Dercum claims good results from its employment, while Fordyce says it is valueless. The safest course to pursue at present is to withhold judgment and await further developments. This only applies to spinal drainage as used in the treatment of neurosyphilis. There are many other affections of the central nervous system in the treatment of which the withdrawal of cerebrospinal fluid is clearly of value.

In skull wounds Boutier and Logre think that the unilateral vascular disturbances liable to follow injury of the brain may be favorably influenced by spinal puncture. Albert claims that lumbar puncture is indicated in the treatment of concussion of the brain, fracture of the base of the skull, and in all cases of irritation of the cortex with increased secretion. Lerda applied spinal puncture in over one hundred cases of pressure of the brain after war wounds, noting the spontaneous subsidence of brain hernias. Brady employs spinal puncture in suspected cases of meningeal hemorrhage in the new-born. Bambaren advises early lumbar puncture in every case of severe and persisting headache. Mingazini has been employing the procedure in the treatment of what he calls persisting hemi-crania, the headache persisting for months or years; a definite cure was realized in 50 per cent of his cases. In three cases observed by Spiller and de Schweinitz removal of spinal fluid had a remarkable effect on swelling of the optic nerve. Musser and Hufford find that lumbar puncture offers a ready aid in controlling the delirium of lobar pneumonia. Lumbar puncture has also been found of value in controlling delirium tremens.

Pike made observations on 25 cases in the Danville State Hospital for the Insane.

Cases of status epilepticus responded promptly to spinal drainage. Epileptic furor or mania showed marked benefit. Complete drainage following apoplectiform convulsions in paretics was followed by a clearing up of the paralysis and a return to the usual mental conditions in twenty-four hours. Complete drainage within a few hours of the stroke in cerebral arteriosclerosis with thrombosis and hemorrhage has been very encouraging; the patient is rendered more comfortable, the blood-pressure is lowered, and life has been prolonged. In manic depressive insanity, with marked clouding of consciousness and psychomotor excitement and intracranial pressure, withdrawal of fluid lessened confusion and decreased excitement. High general arterial pressure was lowered in all cases following complete drainage.

In epidemic encephalitis Barker found lumbar puncture, done for diagnostic reasons, relieved the symptoms so markedly that it was repeated at intervals as a therapeutic measure.

Prophylaxis and Serum Therapy of Yellow Fever.

NOGUCHI, in the *Journal of the American Medical Association* of July 16, 1921, states it is understood that vaccination constitutes only a part of the campaign against yellow fever, and in all localities it has been carried out simultaneously with the anti-stegomyia campaign. Just what part the vaccination plays in checking the further spread of the disease is, therefore, not easily estimated; but one fact stands out, namely, that practically all persons vaccinated escape yellow fever, notwithstanding the opportunities for infection to which both vaccinated and unvaccinated are alike exposed under otherwise identical conditions, as shown by the fact that during the period of ten days following vaccination before the protective effect of the vaccine could have developed, the number of victims of yellow fever among vaccinated and unvaccinated was equally great. Vaccination, which protects the non-immune

person from infection, is a valuable weapon in itself, but it does not supplant the method of elimination of yellow fever by the anti-stegomyia campaign.

The transmission of yellow fever from man to guinea-pigs and the isolation of *Leptospira icteroides* have been repeatedly accomplished by various workers in the course of different epidemics: in Guayaquil by Noguchi (1918); in Merida and Peru by Noguchi and Kligler (1919-1920); in Piura by Gastiaburu (1919); in Vera Cruz by Perez-Grovas (1920) and by Le Blanc (1921).

Anti-icteroides serum reduces the mortality in yellow fever when used on or before the third day of the disease. Of 170 cases, ninety-five have been treated on or before the third day, with thirteen deaths (13.6-per-cent mortality), while the average death-rate of untreated patients during these epidemics has been 56.4 per cent (442 deaths among 783 cases not treated with serum). On the other hand, treatment with serum after the fourth day has no appreciable effect, since there were thirty-nine deaths among seventy-five cases (52-per-cent mortality).

Prophylactic inoculation by means of the injection of 2 Cc. of the killed culture of *Leptospira icteroides* (containing at least 2,000,000,000 organisms per cubic centimeter) is of definite protective value. Among 3230 persons vaccinated twice, no case of yellow fever developed, while 278 cases occurred among the non-vaccinated (Guatemala, Salvador, Tuxpan), notwithstanding the fact that both groups of individuals were equally exposed to infection. Among 4307 persons receiving only a single inoculation of the vaccine, only five suspicious cases (Salvador) developed.

The protection resulting from vaccination does not become effective until about ten days after the last injection, as shown by the frequent case incidence occurring among the vaccinated population within from one to ten days after they were vaccinated. There were twenty-three such cases among 7537 persons who were vaccinated with the standard vaccine.

Editorial

QUINIDINE SULPHATE IN AURICULAR FIBRIL- LATION.

Two decades ago the interesting and important pathological condition in the heart known as auricular fibrillation was unknown, but to-day it is regarded as one of the most frequent conditions met with, and is being studied more and more exhaustively by the aid of various instruments of precision which have been perfected during the last few years. Up until very recently the only remedy that has been found of any material value is the standby digitalis, and this has to be given in much larger doses than those which at one time were thought to be the maximum if the best results are to be produced. Furthermore, digitalis has to be given continuously if the symptoms are to be permanently modified.

Possibly because attention was diverted from everything else during the War, the discovery by Wencheback as long ago as 1914 that quinidine, one of the derivatives of cinchona, had a definite action in terminating paroxysms of auricular fibrillation and restoring normal rhythm was overlooked. It has only been within the last two or three years that other investigators have utilized this drug, and it seems to be clearly proved at present that it bids fair to rival digitalis in the treatment of this dangerous cardiac condition, provided compensation is not impaired.

To use the words of Lewis, Drury and others in a paper which they have recently contributed to the *British Medical Journal*, the action of quinidine sulphate upon the feeble auricle is perhaps one of the most remarkable and dramatic that is now known in therapeutics. The characteristic feature of the reaction is an invariable and conspicuous reduction of the rate of the auricle beat, and, in patients in whom treatment is successful, the progressive slowing of the auricular action is marked, the disordered

action ceases, and the normal action is restored.

Some of our readers may remember that comparatively recently several papers have appeared, chiefly by Lewis, which have shown that auricular fibrillation is essentially what he calls a circus movement, that it is a circulating wave which in its revolution controls the beating of the auricle and which is repeated at the average of 450 times a minute. In other words, the auricle is no longer controlled by impulses arising at a single point, but by a never-ending wave which passes over and over again through the same muscular channels. Studying the influence of quinidine upon this condition, these investigators, and Höffman, have shown that this drug reduces the excitability of the auricular muscle, but that the most striking action of quinidine upon the auricle is a lengthening of the refractory period. In other words, that fraction of time in which the wave in traveling leaves the muscle behind it for some time incapable of response. They believe, in other words, that quinidine emphasizes or prolongs this period 50 per cent, or more, delaying the recovery of the tissues so that they do not react to the following contraction wave. Furthermore, either as a result of this or other influences, it slows conduction of the auricle. Because it impairs contractile power it is probably dangerous when the ventricle is weakened by disease.

They found that quinidine is not efficient in all cases of auricular fibrillation of the chronic type, but that it abolishes the condition in about 50 per cent. Even in the remainder there is nevertheless slowing to a very marked degree, the rate falling from 400, 500, or 600 per minute to 200, 250, or even 300 per minute.

They have also made the interesting observation that frequently when the auricle is slowed the ventricular rate is distinctly increased. They believe that this action is due to the fact that the quinidine by a

paralyzing action on the vagi permits the impulses to cross His's bundle more readily and removes the inhibitory effect of some of the fibers of the vagi upon the ventricle, having an action, therefore, closely allied to full doses of atropine.

It is interesting in this connection to note that here we have a drug (quinidine) found most efficacious in auricular fibrillation, the physiological action of which as far as the vagus is concerned is directly opposite from that of digitalis, which heretofore has been considered the best drug, chiefly through its power to diminish, directly or indirectly, the transmission of impulses over the atrio-ventricular septum. It would appear, however, that the manner in which quinidine acts is the more direct and the better of the two, except when the heart muscle is feeble.

In another paper by Drury and Iliescu in the same issue of the *British Medical Journal*, a considerable series of cases is reported in which the use of quinidine sulphate was successful in six but unsuccessful in seven instances. Their studies were so exhaustive that they are to some extent beyond criticism. They took care in instances where digitalis had been administered that sufficient time elapsed for the effects of the digitalis to pass off, and they also gave one or two preliminary doses of three grains of quinidine sulphate by mouth for the purpose of determining whether there was idiosyncrasy on the part of the patient to this drug. They then made electrocardiographic records every two hours, at 10 A.M., 12 noon, 2, 4 and 6 P.M. Although they speak of seven cases in which the quinidine seemed to be unsuccessful, nevertheless they point out that whether the normal mechanism was finally restored or not, the auricular rate was retarded fully 50 per cent even in these.

Incidentally they strongly advise that when the electrocardiograph is employed in studying the action of this drug the lead should be purely thoracic, as they believe this gives a more accurate record of auricular activity. They found that the maximum effect of a dose is obtained about two hours after its administration.

They also determined, as have some other workers in this field, that six or seven grains three times a day are sufficient to insure retardation of the auricular rate, and that it is apparently inadvisable to attempt to drive the auricular rate below 200 per minute.

Those who have studied this interesting cardiac condition will be interested to note that the quinidine sulphate in six of their cases restored a normal rhythm, while in seven other cases which they consider "unsuccessful" there was retardation, but when the drug was withdrawn the auricular fibrillation returned to its former degree.

In this connection attention should be called to two interesting communications in the *British Medical Journal* apropos of the articles by Lewis and others. The first of these is by no less an authority than Sir James Mackenzie, who apparently is not as yet fully convinced that quinidine will do all that is claimed for it, pointing out that many remedies have on their introduction aroused great expectations which have not been fulfilled, and that some that are potent for good have also suffered from indiscriminate use and so have become unjustly discredited. The important point, however, which he wishes to emphasize is, to use his words, that "a drug acting like quinidine is not free from danger," although he does not clearly point out what the specific danger is, but he seems to separate it distinctly from digitalis as to safety.

He further points out that in auricular fibrillation the failure of the auricle to contract properly not rarely results in the formation of clots, and that these clots may remain *in situ* while the auricle is fibrillating only to be dislodged and sent into the general circulation, producing infarcts, if the auricle regains its normal contractility. Indeed, such an accident may occur even without normal contractility being restored.

The second point which we think will interest our readers that is made by Sir James is his reminder, to use his words, that auricular fibrillation of itself is not always a dangerous or even serious condition. Thus he mentions a patient who consulted him at sixty years of age fifteen years ago

with auricular fibrillation. His heart-rate was however between 60 and 70, so he was told not to worry, but to lead a normal life so long as the rate of his pulse was moderate, and that he needed no treatment; and yet this man at seventy-five years of age is alive and well.

There are other cases, of course, in which the rate of the ventricle is rapid, in which digitalis is essential, and the prognosis is not so favorable if the rapidity persists.

The field in which Sir James thinks that quinidine will prove most useful is in those cases that do not respond to either digitalis or strophanthine or strophanthus intravenously.

Before determining that quinidine is as powerful for good as its enthusiastic admirers claim, it is also well to bear in mind the fact that in a great many cases of auricular flutter or fibrillation the condition is not persistent, coming and going, and this may lead to the belief that the quinidine has been efficient when in reality such a change would have occurred naturally.

Last of all, Sir James emphasizes his point, that it is not the auricular fibrillation which is the essential matter, but rather the state of the left ventricle and its ability to maintain an efficient circulation, the abnormal rhythm being but an embarrassment.

The other communication to which we have referred is one by Orr, which does not deal with quinidine, but which reports an instance of embolism in a case of auricular flutter, therefore emphasizing the point to which we have just referred, namely, that clots in the auricle may be dislodged by the restoration of normal auricle contractions.

FLATFOOT AND RHEUMATISM.

Before modern methods of estimating the condition of the blood by the use of the microscope and the hemoglobinometer, a favorite diagnosis for patients who were in ill health was to the effect that they were suffering from anemia. Later the diagnosis of malaria was sometimes made, before we knew how to discover the real cause

of this infection, and perhaps to-day the term "influenza" is used when a diagnosis is insisted upon and the condition is obscure. So, too, it not infrequently happens that pains in various portions of the body associated with tendons, muscles, or nerve trunks are given the name of "rheumatism." In some instances, this is a correct diagnosis, in the sense that these pains are due to the deposition in these portions of the body of the educts of impaired metabolic processes, and probably the term "rheumatism" is just as accurate as would be the term lithemia or gout. All too frequently, however, the condition is not one dependent upon perverted metabolism, but results from some fault in ligamentous or bony structure whereby stresses and strains are induced which are the real cause of suffering.

Sciatica is not as common a diagnosis to-day as it used to be, now that pathological conditions in the hip-joint and in the sacroiliac joint are better recognized, and pains in the legs and feet are frequently the result of flatfoot or faulty position of the ankle-joint particularly in persons who, with advancing age, gain greatly in weight and whose bony and ligamentous structures are, therefore, subjected to an amount of strain which they escaped in earlier years.

In other cases pain does not develop, but the feet and ankles become somewhat swollen, developing a true edema which will pit on pressure, or a puffiness which will not pit, somewhat resembling a condition in the horse which the veterinarians call "wind-gall," which condition leads the physician to suspect some cardiac or renal disturbance, yet a careful examination will fail to reveal any feebleness of the heart or any abnormality in the urine. Upon the patient reducing weight, or upon the use of properly made shoes or supports for the parts which are under strain, the puffiness to which we have referred disappears.

It is noteworthy that in all the cases which we have described most of the remedies employed, which are intended for a rheumatic or gouty diathesis, utterly fail, although the salicylates may for a time

seem to be successful in that they tend to relieve pain, and this temporary success often still further misleads the physician as to his diagnosis.

It is not to be forgotten, on the other hand, that some persons who have flatfoot or a turned ankle suffer from no pain whatever, and again there is a third class in which these weaknesses or deformities are present and are entirely free from pain at times and then suffer from severe attacks of it, because in these patients a combination of stress and strain with a gouty diathesis results in the strained parts suffering from both stress and gouty deposit. In such cases adequate support to correct the weakness or deformity, regulation of the diet, and the employment of the salicylates or other drugs belonging to this class, prove successful.

A HITHERTO OVERLOOKED FUNCTION OF THE GALL-BLADDER.

We think that the great majority of physicians have not given any thought to the function of the gall-bladder when it is in a condition of health, considering it simply as a reservoir in which the bile is secreted and from which it is expelled into the small intestine when its presence is necessary in the processes of digestion. It has nevertheless been manifest for many years that we have had far too little information concerning its activity. Many have not known that it ejects the bile in spurts rather than by a constant flow, and now we have called to our attention an important research by Rous and McMaster, which proves pretty conclusively that after the bile enters this reservoir the walls of the gall-bladder take up from it much of its moisture, or, in other words, that a concentration process is carried on which, to some extent of course, depends for its thoroughness upon the length of time which bile remains in this viscus.

Aside from any interest which this fact may possess from the physiological stand-

point, it is also of interest because it may lead to a better conception of pathological conditions in the mucous membrane of the gall-bladder which result in changes in the character of the bile as a digestive agent, and also because this process of concentration may have more to do, than appears at first thought, with the formation of gall-stones. It is also of importance because it once more emphasizes a fact too frequently overlooked by medical men, namely, that there are few organs of the body which ought to be removed, although there are a number that can be removed without immediate disaster to the patient and sometimes without remote evil effects. As Rous and McMaster well say, there appears to be little general realization of the physiological uses of the healthy gall-bladder, which has now become a favorite surgical trophy, and then proceed to quote not only the results of their own investigations but those of a number of others. Thus they point out that an intermittent discharge of the bile takes place into the duodenum during the passage of chyme from the stomach, but then ceases, and that this having occurred an ejection of bile takes place only very occasionally until food is taken again. Further, that this bile is definitely bladder bile, that is bile which is undergoing concentration, whereas after the gall-bladder has been removed by the surgeon, the bile dribbles continuously, and during fasting may fill the duodenum and be passed freely in the stools, a condition which is diametrically opposite to that which occurs physiologically. It has also been found that under these circumstances the bile passages undergo a general dilatation, and a condition of biliary incontinence is established. It, therefore, appears that by the process of concentration, to which we have referred, the bile which is ejected into the duodenum when food is passed out of the stomach is a concentrated bile, or one which is capable of being much more active in its function than dilute bile which is continually flowing. As Rous and McMaster well say, the fact that few ills follow upon the removal of the gall-bladder in many cases really means

that the body has adapted itself to the loss. It does not prove that the loss is unimportant.

In another contribution entitled "Physiological Causes for the Varied Character of Stasis Bile," which appears in the same issue of the *Journal of Experimental Medicine*, these authors ask the question, how do these facts, along with others which they present, bear on the present vogue of cholecystectomy; and while they do not seem to answer this question directly, nevertheless the results of their experiments indicate that the gall-bladder has a very definite function to perform, and therefore cannot be removed with the same impunity as the appendix.

It is interesting in this connection to note that the dilatation of the ducts in cases of cholecystectomy, to which we have already referred, may be considered as an effort on the part of nature to provide a substitute reservoir for bile, and this attempt succeeds provided the sphincter of Oddi does not give way. Indeed in some cases it would appear that this sphincter undergoes hypertrophy and becomes correspondingly adequate.

As we have already said, these researches have a definite bearing upon stone formation, and Rous and McMaster believe that measures directed against undue concentration of bile by the gall-bladder should be borne in mind, as, for example, frequent feeding, since by this means the gall-bladder will be stimulated to expel its contents often rather than at long intervals.

It is apparent, therefore, that these two papers should be carefully studied not only by medical men, but also by surgeons, in order that they may have a clearer conception of the function of an organ which both in health and disease is of no little importance.

Last of all, we may express regret that the research referred to did not extend to the study of the influence of certain drugs upon the activity of the gall-bladder. It has long been known that all experiments upon animals and man, heretofore, have apparently shown that calomel and other

drugs which are supposed to increase the flow of bile do not seem to do so in the presence of a biliary fistula; whereas clinical evidence seems to be quite clear in regard to this point. The question naturally arises at this time as to whether calomel and blue mass, and other drugs which have a cognate influence, cause the liver cells to secrete more bile or cause the gall-bladder to eject it more freely into the intestine. As most cases of biliousness are apparently due to a lack of bile in the duodenum, it is entirely possible that hepatic torpor, so-called, is not the actual cause of these symptoms, but that gall-bladder torpor is responsible and that the calomel causes the gall-bladder to eject its contents, thereby producing relief. Indeed, we are familiar with one case in which in the course of bilious headache the patient has repeatedly noticed that some hours after calomel is taken he has a sensation in the region of the gall-bladder which he describes as a "feeling as if a key was turned in a lock," and from that moment his symptoms begin to rapidly disappear. Possibly this sensation represents a powerful ejection of bile into the intestine.

THE RELATION BETWEEN CHILLING OF THE SUR- FACE AND NASAL AND POSTNASAL DIS- ORDERS.

If there is one thing firmly fixed in the minds of the profession and the laity, it is that chilling of the cutaneous surface is prone to produce what is known as a "cold in the head" or a nasopharyngitis, and yet, heretofore, there has been little knowledge which would seem to place such an opinion upon a scientific basis. Since we have had a more accurate knowledge of the relationship of microorganisms to the causes of disease, it has been said that cold lowers the vitality and so permits the microorganisms to multiply and infect, but it apparently has been left to Mudd, Goldman

and Grant to show why it is that infections of the nasal and postnasal mucous membranes so commonly follow chilling of the surface of the body.

By means of ingenious forms of apparatus, specially devised for their research, whereby sudden changes in local temperature could be readily observed, and carrying out their experiments upon human beings, they have reached results which throw a great deal of light upon this subject.

This is not the place to describe in detail the type of apparatus which they employed, but apparently there can be no doubt of the accuracy of their observations, since every precaution was taken to eliminate the effects of trauma and to use instruments which would be accurate. Precautions were also taken as to the temperature of the air inhaled and as to the rapidity and depth of respiration.

The subjects of the experiments were superficially chilled by an electric fan or by exposing the surface of the body to the temperature of the air of the room. It is interesting to note that they found that the chilling of the body surface without exception caused depression of the temperature of the nasal mucous membrane, and they tell us in the *Journal of Experimental Medicine* for July, 1921, that in some instances this amounted to as much as 6° C., a drop which is scarcely credible. This drop was chiefly if not entirely due to an intense vasoconstriction and consequent diminution of blood supply.

When the subject of the experiment was properly covered with clothing a partial recovery of blood supply promptly recurred, although in 10 out of 12 experiments the recovery was incomplete during the period of observation. While a fall of 6° C. has occurred, a typical fall averaged between 1° C. and 2° C. when chilling of the body surface took place.

It would appear, therefore, that these experiments confirm the theoretical deductions heretofore advanced, namely, that chilling of the surface renders these parts liable to infection, but it is interesting to

note that the process is apparently the reverse of that which has heretofore been considered present, since heretofore it has been thought that chilling of the surface produced intense congestion of the nasal mucous membrane and that of the nasopharynx, and that this induced the so-called "cold." It would now appear that an intense ischemia is produced, and that the absence of blood in the parts permits infection, the congestion and hyperemia, which is usually considered the earliest manifestation of a cold, being in reality secondary and possibly due to an effort on the part of the body to flood these parts with blood in the hope of providing a sufficient number of leucocytes to overcome the invading microorganisms.

So far as the therapeutic bearing of this research is concerned, it would appear that under certain circumstances the application of astringent substances to the nasal mucous membrane in the presence of infection may actually increase the danger of further infection, since by driving blood from the part the leucocytes are not allowed to remain to carry on their protective processes.

ABDOMINAL TUBERCULOSIS IN CHILDREN.

It is the commonly accepted belief that abdominal tuberculosis in children is usually of bovine origin, the bacillus being carried by milk or milk products, such as butter, cheese, and ice cream. Apparently the infection may gain entrance through the unbroken mucosa, the cecum, and lower portion of the ileum, and thereafter the mesenteric glands, and at times the whole peritoneum.

Ladd (*Boston Medical and Surgical Journal*, Sept. 15, 1921) states, in contradiction to the generally accepted view, that the condition is as frequent in the first year of life as at any age up to twelve years. He further observes that the plastic type—i. e., that in which there is no fluid, but in which the coils of intestines are adherent to one another and to the parietal peritoneum—

does not represent a curative effort, since a fatal termination is a common result even with no other lesions in the body.

He alludes to the difficulty of diagnosis and observes that although the disease is by nature more or less chronic, the symptoms for which these children seek relief are in most cases acute and recurrent. Recurrence of moderately acute symptoms of short duration is perhaps the most uniform feature.

Where the infection is confined to the mesenteric glands of the lower ileum and cecum and these break down, to differentiate from an appendix abscess is frequently impossible. The symptoms are acute, vomiting has taken place, there is tenderness over the appendix region associated with involuntary muscle spasm and rigidity. The temperature is between 100° F. and 102° F. Under such circumstances time is usually not taken to ascertain the result of a Von Pirquet reaction and the white count may be only suggestive. When the glands are less broken down but still large enough to be readily palpable, and with less tenderness than one would expect from an appendicitis and more mobility of the mass, a correct diagnosis may be made; but simple hyperplasia of the mesenteric glands must be remembered in the differential diagnosis. Again, where the glands involved are those of the mesentery of the ileum, further removed from the ileocecal junction, a mass may develop in the midline just below the umbilicus which may be differentiated from an appendix abscess by its feel, mobility, and position. When time is taken for a Von Pirquet reaction, it is a great aid to diagnosis, a negative reaction with reliable tuberculin, practically ruling out tuberculosis except in children who have an overwhelming infection. The only cases of abdominal tuberculosis with a negative Von Pirquet reaction have been in infants having in the abdomen large tubercular masses and the peritoneal cavity practically obliterated by adhesions.

The ascitic stage of the disease offers fewer difficulties in diagnosis. The symptoms simulate less closely other diseases.

The feature usually noticed is the gradually increasing size of the abdomen. Ascites from other causes is perhaps more rare in the child than in the adult, and one should be able to demonstrate its cause. Rare conditions, such as large ovarian, mesenteric or omental cysts, must be considered and are sometimes difficult to differentiate. Ladd has had five such cases referred to him with the diagnosis of tuberculous peritonitis, some of which have been correctly diagnosed as cystic only after the child was etherized before operation. Signs of abdominal fluid, with small palpable masses of mesenteric glands, associated with a positive Von Pirquet, lack of extreme muscular rigidity, and symptoms of a diffuse septic peritonitis, make the diagnosis of tuberculous peritonitis possible.

Patients suffering from the plastic stage of the disease may have a comparatively long story of digestive disturbances, being below par and not gaining in weight. They also usually have a story of recurrent attacks of abdominal pain, and come to the surgeon only when these attacks become severe or are associated with vomiting and the other signs of obstruction, or possibly when a fecal fistula develops at the umbilicus. As we see patients in this stage not only are they more acutely sick than those in the other stages, but also, in their poor development and emaciation, show more evidence of the chronic malady from which they are suffering. Among plastic cases, five suffered from complete obstruction, two had perforation with septic peritonitis superimposed on its tubercular lesion, two had fistulæ, and one had mesenteric thrombosis with gangrene of a foot or more of ileum.

History of the treatment of these forms of tuberculosis is interesting. They were first practically all considered hopeless. Then there was a time when surgery was resorted to for most of the cases with some gratifying results. Later it was found that surgery was by no means a cure-all and that many patients recovered as the result of outdoor life, proper hygiene, rest, and a nourishing diet. The pendulum then swung

back too far the other way and surgery was omitted almost entirely. To-day, one will find varying points of view. There is sufficient evidence at hand to warrant establishment of more uniformity of treatment than at present exists.

First in importance should be placed proper hygiene, diet according to digestive ability of patient, and outdoor life. Any treatment disregarding these principles is unsound. Surgery as an aid to treatment in selected cases is of unquestioned value, but the case should be logically selected as far as the difficulties of diagnosis make that possible. Kerley advocates operating only when the amount of fluid is sufficient to interfere with respiration, or the heart, or when obstruction is imminent. This teaching does not seem to be based on either the pathological course of the disease or practical results. As Kerley himself states, the diseased glands may at any time be the starting place for localized or general tuberculosis and probably responsible for a considerable portion of the cases of tuberculous peritonitis. Therefore, when one can make a diagnosis of localized tuberculous mesenteric adenitis, the logical procedure is to remove the infected glands. Likewise, when one finds localized caseous glands on an erroneous diagnosis of appendicitis, they should be removed. As a practical matter this has been done many times with gratifying results, both immediate and lasting. There are a considerable number of such cases reported in literature with good immediate results, and eight of the writer's own cases followed from one to eight years have remained apparently well. With this procedure there has been no immediate mortality, but of course it must be understood that the number of cases for which it is suitable is limited; and no one would advocate attempting to remove widely disseminated mesenteric tuberculous glands. Even in such cases, however, it is logical, when there are only a few that show a tendency to break into the peritoneal cavity, to prevent this by their removal, and by so much reduce the chance of a peritonitis or general tuberculosis.

With regard to the large simple tuberculous mesenteric abscesses, it is proper to incise them, evacuate the pus, wipe out the cavity with iodine, and close the incision in the mesentery as well as the abdomen without drainage. Three patients thus treated have been followed over four years and all appear well. Two other similar cases were treated by drainage; one died and one is improved, but has some digestive disturbance and a ventral hernia.

In the ascitic stage of the disease the merits of surgical interference or the reasons for resorting to it are not so clear. Many patients, however, who are not improved before laparotomy turn the corner and start to improve soon after and go on to ultimate recovery. When laparotomy is beneficial to such cases it is probably due to the hyperemia produced by the evacuation of the fluid and letting air into the peritoneal cavity. That this takes place has been proved experimentally. Dr. Mixter has advocated the injection of air or nitrogen into the peritoneal cavity to replace the fluid. Just what the effects of this procedure are has not been demonstrated experimentally, and the practical results have not been striking enough to justify substituting it for the simpler procedure. Nineteen patients with tuberculous ascites have been followed for periods of from three to twelve years. Of four who had no operative interference, three are apparently well and one dead. Eight had laparotomies with the injection of either air or nitrogen. Six of these patients are apparently well and two are dead. Of seven patients who were subjected to simple laparotomy with the evacuation of fluid, six are apparently well and the seventh has a tuberculous keratitis, but otherwise is improved.

Ladd states that at the Children's Hospital there have been twenty-three cases of the plastic stage. Seven of these who had no operation are all dead. On three an anastomosis was performed to try and relieve obstruction. Two of these patients died before leaving the hospital, and the third was temporarily relieved but died five months later. Of the remaining thirteen

who had exploratory laparotomies performed, eight are dead, one is somewhat improved, and four are apparently well. In this stage of the disease the fact that no cases recovered which were not operated on and a few recovered who were, does not lead the writer to the conclusion that the operation was the cause of the recovery or that it was beneficial to the patient in any way, except as establishing a diagnosis and causing proper hygienic treatment to be carried out. That gaining entrance to an extremely small portion of the peritoneal cavity through an incision in the abdominal wall can cure extensive plastic peritonitis is not logical. On the other hand it is difficult to see a child die from obstruction without attempting to relieve it, and surgeons will probably continue to perform many unsuccessful operations for this condition with an occasional gratifying one until it becomes possible to avoid the condition existing.

CONCERNING CATARACT.

Impairment of vision, steadily progressing until it reaches the entirely crippling stage, in those otherwise sound of body and alert in mind, caused by lens opacity, is an affliction popularly regarded as an almost normal manifestation of advancing age. Because of the number of people thus afflicted, and because of the dread of operation, victims of cataract for all time have been susceptible to the promises of charlatans, whose "cures" or preventive applications and medications have been widely and futilely used.

Sattler (*Ohio State Medical Journal*, August, 1921) states that a long absurdly tolerated terminology designating cataract as immature, mature, or hypermature is misleading and at variance with existing textural alterations and clinical facts, as will be abundantly and conclusively upheld by examination by transillumination and transmission of light.

The transformation which is slowly and inexorably taking place, from partial to general loss of a former transparency in the

lenses of an aged person, is the very opposite of an exuberant nutritional activity of the vascular and lymph channels or approaching or accomplished growth or maturity of an organ or living structure, but is, as commonly accepted, a senile nutritional aberration, akin to cell or lens band extinction, desiccation of the connecting cement substance from defective water or lymph absorption, loss of elasticity or a variable degree of hardening or sclerosis, and, less frequently, a softening or solution of a former textural firmness of the anterior and deeper layers of the lens body substance, often even with reduction to a liquid, milky fluid, with the remaining harder central portion or nucleus a free or floating mass.

The following conclusion embraces the united confirmed opinions that, as in the past, every progressive and experienced ophthalmic surgeon will continue to extract, in the present and in the future, cataractous lenses which are only partially opaque, or those in which the clouding is not general, if this condition spells ocular infirmity with the impossibility of continuing wonted activities for his patient. He will select the safest means of lens delivery which present-day surgical standards uphold as most approved, irrespective of method. He will be guided only by a safe and sober general intelligence and will direct his own course in support of the foremost modern conclusions of this important subject which represents, in name and in fact, a modern truth to every one who has the mutual interest of humanity and surgery at heart and hand.

Every case of senile cataract with commonly accepted surgical risks is operable. It is not the textural alterations of a partial or more or less general opacity of the lens which decides the question of an immediate or deferred operation for its extraction, but the degree of helplessness or the ocular infirmity of an individual which is thereby induced.

The most valuable present-day conclusions as to the surgical treatment of senile cataract center around the now generally

accepted feasibility of lens extraction in its unbroken capsule.

Surgery and humanity alike are indebted to Lt.-Col. Henry Smith for his signal discovery, which parallels, in originality and importance, the cardinal features of extra-capsular delivery, the original or first method of extraction, and the supreme discovery of Daviel's genius.

It has with many and will soon become the resolute aim of every progressive ophthalmic surgeon to adopt or combine this new means of lens expulsion in its intact capsule, with due appreciation of its limitations, but with even fuller consideration of essential present-day surgical facts, whether he selects the Smith-Indian method as such, or any other modernized classical one, if a thorough general and special surgical training, deftness of hand, perfect vision and resolute judgment on his part can be counted upon.

In judging the physical characters of an opaque lens, with every diagnostic means at our disposal before an operation, which has for its purpose either an extra- or intra-capsular extraction, we can safely be governed by two generally accepted facts: That cataractous lenses for which senility is the main cause in evidence can be placed in two groups. The smaller one includes the large flat, uniformly sclerosed or desiccated lenses, dense in color, approaching amber or blackness, with sharp and hard equatorial borders, and especially common among individuals of advanced age; these do not lend themselves to a ready expulsion in capsule for the inexperienced, and have been for most surgeons the stumbling-block or the cause of absolute failure. If, however, selection be made from the larger or more numerous group, among which the lenses show a lighter color, but always with slight or greater tumefaction of lens sub-

stance and nucleus and rounding rather than angularity of the equatorial region, usually with presence of translucent areas, as objective examination can in most cases conclusively establish, their purposive selection for an intra-capsular expulsion will be rewarded with successful and facile delivery unless uncommon happenings take place.

If expulsion succeeds by the Smith-Indian method, without uncommon complications, it is a first and final success. It completely prevents the escape or retention of lens and capsule tissue, it also eliminates prolonged and painful healing, and as certainly the ever deplorable postoperative consequences. It also insures an equal or large proportion of uniform, painless recoveries, with more nearly approaching perfect or satisfactory results to patient and surgeon.

If an extra-capsular delivery, and its capsular opening—no matter how spacious—is made part of the technique of a modernized method of an older or classic method of lens extraction, we can never be certain that it has been completely emptied of its contents. Often, in spite of the best illumination and clear operative field, the clearest vision of an experienced and deft operator, he will be unable to prevent with certainty the incarceration of wedged-in semitranslucent or of softer brittle and insoluble scales of lens corticalis.

These retained masses, now equivalent to foreign bodies, and the physicochemical changes they induce through liberation of lens proteins, by their so often destructive consequences, often mar or reduce our otherwise partial or complete successes, which, however, compare as favorably, so far as visual results are concerned, and from a surgical view-point even more so, with similar ones of the intra-capsular method of lens expulsion.



Progress in Therapeutics

Medical Therapeutics ·

Radium in the Treatment of Keloids.

HARRISON, in the *Medical Review of Reviews* for July, 1921, states that a burn is the most common cause for keloid development, and in his series twelve of the cases were due to ordinary burns from fire and two from acid burns. Some of the former have been very extensive, requiring long treatment and observation over a period of years in order to secure the best cosmetic result. One of the most interesting cases was that of a young woman, thirty-two years of age, who had sustained a severe burn of both hands and forearms as a result of a gasoline explosion. There was extensive keloid growth on the extensor surfaces, and the parts were so bound down that the wrist and fingers were fixed, more especially on the left hand. X-ray treatment had been given without any benefit. Radium treatment was begun in November, 1914, the left hand only being treated at first. By January the growth was much reduced, particularly on the back of the hand and wrist, and by the end of February the wrist could be moved quite freely. She was very irregular in reporting for treatment, but eventually the keloid tissue was all reduced and an almost perfect restoration of the normal mobility obtained.

Owing to the presence of smallpox in Ontario during recent years more vaccination has been carried out than had been the case for some years previously. In some cases the reaction was quite severe, producing extensive sloughing and ulceration, which, in healing, occasionally became keloidal. Radium treatment has been carried out for the removal of the keloid, where it is disfiguring, with very satisfactory results.

The experience with forty cases has con-

vinced the writer that radium can remove keloid growth in all cases. Naturally in some a better cosmetic result is obtained than in others. It must not be understood that a perfectly normal skin is left when the keloid is removed. Scar tissue is still present, varying in color and texture from the normal. But it is claimed that no other method of treatment so far devised presents the same ease of application and sure clinical results as are obtained by the use of radium.

The Treatment of Placenta Prævia.

THOMPSON, in the *Johns Hopkins Hospital Bulletin* for July, 1921, states that during the past few years a rapidly growing mass of literature has accumulated which advocates the adoption of more radical methods in the treatment of placenta prævia. Particularly since the appearance of King's article upon the subject the employment of Cæsarian section has been recommended as the safest and most conservative method of treating selected cases of this serious complication of pregnancy and labor, and certain writers have even gone so far as to advocate its routine employment.

For the past decade, at least, Williams and his associates have maintained and put in practice the belief that except in rare instances conservative measures give better results so far as the mother is concerned than more radical operative interference. In order to determine whether the results obtained justify such a belief, Thompson has gone over the first 10,000 admissions to the obstetrical ward of the Johns Hopkins Hospital and has analyzed the cases of placenta prævia included therein.

Of fifteen cases in which delivery was

effected after manual dilatation of the cervix, the following may be said: In the early years of the service *accouchement forcé* was the routine method of delivery whenever the cervix was not sufficiently dilated to permit prompt termination of labor by the ordinary obstetrical procedures. In such circumstances the cervix was dilated manually by Harris's method, after which delivery was effected by version and extraction, with the exception of a single case in which the existence of a primary breech presentation made version unnecessary.

In this group he had to deal with the following varieties of placenta prævia: 6 centralis, 4 partialis, and 5 marginalis; and two mothers and eleven children were lost. In one of the fatal cases the patient was moribund on admission, and would probably have died irrespective of the method of treatment, so that her death can scarcely be attributed to the means by which delivery was effected. On the other hand, the other death was directly attributable to the operation. In this instance, which was reported to the American Gynecological Society by Williams in 1906, the markedly exsanguinated multiparous patient was admitted with complete placenta prævia and the cervix somewhat less than half dilated. While Williams was examining her profuse hemorrhage occurred, and the cervix seemed so soft that he felt that it could readily be dilated. Manual dilatation was effected with the greatest ease, the child turned and extracted, and the placenta expressed. The cervix was then inspected, and a deep tear extending to the fornix was discovered on the left side. This was exposed and apparently satisfactorily repaired, the patient being put to bed in good condition. Without further external bleeding she soon began to do badly and died four hours later.

At autopsy it was found that the tear had involved the lower uterine segment, and that only its lower portion had been repaired by the vaginal sutures, with the result that the bleeding had continued between the folds of the left broad ligament and had led to the formation of a hematoma 15 to 18 cm. in diameter.

Although members of the staff had long realized that manual dilatation of the cervix in placenta prævia was usually accomplished at the expense of deep cervical tears, which frequently required immediate repair, the fatality just described still more forcibly accentuated the dangers of the procedure, and led to its abandonment as a routine practice, together with the recognition that generally speaking it represents the most dangerous method of treating this complication.

Following the recognition of the danger of *accouchement forcé*, the use of the rubber balloon has in recent years become the routine method of treating placenta prævia except when the cervix is fully dilated when the patient is admitted to the service. Prior to the world war the reënforced Champetier de Ribes balloon was employed with the greatest satisfaction, but since that time he has been forced to use Vorhees's bags instead. These are of domestic manufacture, and leave a great deal to be desired, in that they are less efficient as dilating wedges, and are distinctly less durable.

Balloons have been employed in 37 cases. In the series the following types of placenta prævia were noted: 6 centralis, 17 partialis, and 14 marginalis. All of these patients recovered.

Ordinarily the balloon is introduced into the uterus after rupturing the membranes, or after perforating the placenta in centralis cases, in preference to the extraovular method advocated by Kosmak and others, because it has been felt that better results are obtained by compressing the placenta against the area of separation. Where haste was essential, traction was made upon the bag by means of a weight attached to the end of the tube and allowed to hang over the foot of the bed. Usually the largest-sized bag was allowed to remain in place until it was expelled spontaneously, after which the course pursued varied according to circumstances. If the bleeding had ceased, and the patient was in good condition, spontaneous delivery was awaited, and occurred in 10 of the 36 cases. On the other hand, if the bleeding continued, or if the

patient was in poor condition, or if the uterine contractions appeared inefficient, delivery was effected by the most conservative means available; the records show that version and extraction were employed in 18, breech extraction in 5, and forceps in 3 cases.

More particularly, since Thompson has been compelled to employ Voorhees's bags, complete dilatation of the cervix was not always effected, so that in five instances it was necessary to complete the process by manual methods. These, however, are not comparable with the *accouchement forcé* which was formerly employed, since as the major part of the dilatation had already been effected by the balloon, all that is required is to overcome the final resistance. Such secondary manual dilatation was required three times on account of premature and repeated rupture of the balloon, and twice on account of tetanic uterine contractions, or because the patient's condition was so serious that it was felt that she could not survive a longer delay.

As has already been indicated, all of the 36 patients in this series recovered, and such a result is the more remarkable, as they were not treated by a single individual possessing unusual dexterity and judgment, but by a succession of resident obstetricians who naturally varied considerably in ability. With such maternal results it can justly be claimed that treatment by means of the balloon is eminently satisfactory, and accordingly one can readily understand why the employment of Cæsarian section has found so little favor in this service.

Of course, it must be admitted that the latter affords a ready method of coping with the situation, and does not require the hours of waiting incident to more conservative methods of treatment. On the other hand, it must be borne in mind that many of the patients who are admitted exsanguinated, and after having been subjected to vaginal manipulations by physicians with imperfect technique, are poor surgical risks, so that the mortality following Cæsarian section in them must inevitably exceed that noted in

our service. Furthermore, it should be remembered that the uterine cicatrix following Cæsarian section represents a *locus minoris resistentiæ*, so that the possibility of its rupture in subsequent pregnancies constitutes a danger, which certain writers consider so great as to justify the dictum "once a Cæsarian always a Cæsarian." Consequently, if a Cæsarian is done, it may condemn the patient to repeated sections in any future pregnancies. If this is the case, the unprejudiced observer must admit that it is a questionable procedure so to treat the ordinary case of placenta previa that this will be necessary, more particularly as other methods of treatment are available, which give as good or even better immediate results and do not compromise the future child-bearing career of the patient.

On the other hand, it is argued by the advocates of radical treatment that Cæsarian section offers additional advantages in the way of better prospects for the child, and at first glance such an argument appears convincing, more particularly when he admits that less than 30 per cent of the children in his service were saved. It should, however, be remembered that placenta prævia is a complication which tends to become manifest at a period when the child's prospects are minimal. His figures show that it occurs eight times less frequently at term than at premature labor, so that we ordinarily have to deal with children which have no chance for continued existence after birth, or which are so premature that they readily succumb to the loss of blood or other conditions incident to the condition. Consequently, it seems justifiable to demand that Cæsarian section should be employed only under the strictest indications, and should not be considered as a routine method of treatment. In addition, it should be realized that placenta prævia is inevitably associated with a high infantile mortality, and consequently obstetricians should hesitate to advocate methods of treatment which, while they may save the lives of a few more children, do so at the expense of increased maternal mortality.

Tobacco and Work.

In an editorial on this subject the *British Medical Journal* of July 2, 1921, refers to an article on the output of users and non-users of tobacco in a strenuous physical occupation, by Baumberger, Perry, and Martin in the *Journal of Industrial Hygiene* for May, which was the second article of a series of records dealing with the general significance of the use of tobacco in industry. The previous article dealt with the effect of tobacco on strenuous mental work of a routine nature, the occupation chosen for investigation being telegraphy; it was found that the heavy smokers did not maintain the level set by the light smokers; there was a lessened ability to sustain output at the end of the working day, and a diminished power to react by increased effort to an increase in the volume of work. Heavy smokers had a better output during the first hours, but this was not enough to compensate for the lowering of efficiency toward the close of the day. The present study, on the other hand, required a routine occupation in which some process was repeated many times during the day and was dependent on the speed of the individual worker, unaffected by the rate at which machinery was driven; bottle making was chosen as best meeting the required conditions.

In the factory where the investigations were made the old method of blowing glass bottles by mouth had been largely abandoned, and the work was for the most part done by machinery manipulated by certain skilled workers, with the aid of inexperienced helpers; in some machines, however, the whole process was carried out automatically under the supervision of an unskilled attendant. The average age of the eighty-five skilled workers studied was thirty-six years, and the average number of years spent in the glass industry was twenty. The men were largely native-born in the United States, with little schooling, and, on the whole, a very steady, clean-living class, their earnings being from eight to ten dollars a day. Their smoking and

chewing habits were studied by direct questioning, and by observation and indirect conversation. Of the men 8 per cent did not use tobacco, 83 per cent smoked, 29 per cent chewed, and 20 per cent both smoked and chewed. Apparently 9 per cent chewed but did not smoke.

From the data obtained it appeared that the workers who chewed had a much lower output rate than those who only smoked or did not use tobacco in any form; the light smokers, however, showed some inferiority in output rate, and the heavy smokers a slight superiority. The authors seek to explain this result by surmising that "insufficient use of tobacco has more deleterious effects than a larger use which might confer an immunity." But it seems more likely that the differences are not statistically dependable, and it would be well to have more details than the article gives about the workers investigated and their habits of work. The low output of the chewers of tobacco as compared with smokers is probably due, as the authors suggest, to the greater absorption of nicotine. The conclusions drawn from the investigation are that in a strenuous physical occupation of this type smoking has comparatively little effect, but that the output rate is distinctly lowered by chewing.

Studies in Carbon Monoxide Asphyxia.

HAGGARD, in the *American Journal of Physiology* for July, 1921, states that death under carbon monoxide asphyxia is due to failure of respiration. This is in the nature of a fatal apnoea vera. The anoxemia resulting from the formation of carboxy-hemoglobin induces excessive breathing; and respiratory failure follows the excessive loss of CO₂.

Oxygen deficiency caused by carbon monoxide, even in advanced asphyxia, is not in itself sufficient to cause impairment of auriculo-ventricular conduction. Following respiratory failure, however, the increased anoxemia from this cause speedily

results in the development of heart block through its various stages.

By restoring respiration and rapidly eliminating the carbon monoxide by means of inhalations of carbon dioxide and oxygen, cardiac conduction is restored to normal following the development of block.

The cardio-inhibitory center maintains its activity longer than does the respiratory center. This center is stimulated by the increased Ch which occurs during respiratory failure. From this there results a temporary cessation of auricular activity. This period of inhibition is prevented by the administration of atropine.

When respiratory failure is prevented by means of inhalations of 8 or 10 per cent carbon dioxide, the carbon monoxide combination with hemoglobin rises to an unusually high percentage without any evidence of impairment in a-v conduction. This indicates that there is no direct toxic action of carbon monoxide upon the cardiac conducting system.

Illuminating gas results in an earlier development of respiratory failure than does pure carbon monoxide in corresponding concentration.

Electrocardiographic records are given from two animals which differed from the rest in that one developed a transient period of alternation involving the R and T waves and the other presented, during the time of complete a-v block, a condition resembling auricular fibrillation or flutter.

Paresis Treatment by Arsphenamine and Mercury.

In the *Boston Medical and Surgical Journal* of July 14, 1921, BONNER cites a series of cases that were treated at the Warren State Hospital, Pennsylvania, between July, 1918, and July, 1920, with a view to determining possible benefit in the administration of combined treatment. In order that a comparison may be made, the records of untreated admissions during this period, suffering from paresis, were reviewed, and some interesting facts brought forth, espe-

cially regarding the brief tenure of life in this disease. All the cases studied were diagnosed at staff-meeting and further confirmed by positive laboratory findings. The patients were not selected, but varied in both physical and mental state. The number of cases treated is small, but results obtained are in agreement with the findings by workers with a larger group.

There has been considerable interest shown in this subject by a number of State hospitals during the last five years, and the value of intravenous injections of arsphenamine in neurosyphilis has been well brought to test. In this work mercury inunctions were employed, and also a brief course of potassium iodide. The object of this paper is to record the findings as observed in a two-year period at this institution.

What benefit was accomplished will have to be measured by such facts as the duration of life after admission, capabilities exhibited after the initial disturbance, and continued improvement and conduct sufficient in some cases to warrant a parole from the hospital. These data, of course, are readily obtainable from the case histories and daily observation of the patient. It was interesting from a psychiatric view-point to note a peculiar form of insight exhibited by many of the paretics under treatment, manifested in their anxiety and coöperation to receive treatment. This, of course, refers to the less deteriorated cases.

Weekly treatments were given twenty-eight males diagnosed general paresis, beginning with 0.3 gm. arsphenamine, which was pushed as rapidly as conditions would permit, to the maximum 0.6 gm. There were but few unfavorable reactions in well over three hundred injections. It was intended to use blue ointment to a point of saturation during the entire period, but shortage of help prevented this valuable adjunct being used as consistently as was desired. Each case also received, for one month, potassium iodide in a dosage of thirty grains per day.

It was found that the Wassermann reaction was influenced but little in the purely parietic types, even with the most intensive

treatment. One case, bordering on the paretic zone, as interpreted from the gold sol reading, was reduced; one clearly in the paretic zone was reduced, and one spinal fluid was changed so that the gold sol reaction was absent. Among the cases allowed to go home, but one improved, as far as the serology was concerned, which is an interesting inference.

The average time that the disease had existed, both in the treated and untreated cases, previous to admission, reckoned in months, was fifteen. The average duration of life in the treated cases that died in the hospital was five months, and four months for the untreated cases. The remissions in the treated cases were longer sustained than in the untreated, and the former made much better ward cases.

Of the treated cases, eight have been discharged, or twenty per cent, and but two of the untreated cases have been removed from the hospital, or four per cent. At the expiration of the two-year period, twenty-seven out of forty-two untreated had died, and of the treated, six died before a minimum series of ten treatments had been given, and two died shortly after the series was completed. Twelve of those completed are still residents of the institution, and but two of this number are bedridden.

Continued observation of the treated cases is necessary as a criterion of the advisability of routine intensive treatment. Surely, if some benefit is obtained, the matter should not be lost sight of, and a measure of relief offered in this deplorable condition. It must be remembered that the majority of the cases that State hospitals have to deal with are far advanced. In the interests of humanity, if the general practitioner would consider every syphilitic as a potential paretic, paint the future as it may possibly be, apply intensive treatment, and advise a routine Wassermann and lumbar puncture at least once a year, keeping careful records, the number of paretics during the ensuing years would be greatly diminished and thus many wrecks prevented.

Bonner summarizes his article as follows:

1. Course of duration of bedridden stage seems lessened by treatment, and dying patients in this stage do not linger so long in the usual wretched state.

2. Serology bears no relation to remissions.

3. Duration of ward life seems lengthened.

4. The results are found to be favorable to treatment, but do not warrant a change in prognosis.

5. Certain cases respond and others do not. No explanation is offered, unless it may be that the meningeal types, as have been reported, offer a better therapeutic opportunity.

Enteroptosis and Dropped Kidney: A New Method of Treatment.

MCCAY, in the *Indian Medical Gazette* for July, 1921, states that when the diagnosis is made the following line of treatment is to be carried out:

1. The patient is kept strictly in bed for a month or six weeks, according to the severity of the case. The foot of the bed is raised by wooden blocks fifteen to eighteen inches high. The shoulders of the patient are kept low, but the head may be raised to a comfortable position by pillows. A nurse should be employed if possible and a bedpan used. The more strictly the patient is kept at complete rest in the prescribed position the better the results will be.

In patients who absolutely refuse to employ the bedpan the treatment will often give excellent results, but success is not so certain as if absolute rest is maintained.

2. Massage of the abdomen is carried out for half an hour twice a day, olive oil being used as a lubricant in the hot weather, but if it is not objectionable to the patient, massage with cod-liver oil is preferable in the cold weather. Massage is also used to the rest of the body, and the muscles of the abdomen are improved in tone by exer-

cise. The patient is instructed to raise the legs from the bed, keeping them extended all the time, and keeping quite flat on her back in bed. At first the patient can only raise one leg at a time as a rule, but soon she will be able to raise both together for a considerable number of times. The limb muscles are also kept in good tone by massage and by exercises against resistance. The spinal muscles are exercised by the movement of arching the back. It is of course understood that the patient keeps in the supine position in bed while these exercises are carried on.

3. The bowels are kept open by suitable doses of an aperient like cascara evacuant.

4. The diet need not be so restricted as one might suppose. Plain simple food of almost any kind is permissible, and the patient is usually gratified to find that a normal diet can be digested without pain or discomfort within a few days of the commencement of the treatment.

Any obvious errors of diet will be corrected, such as the eating of pastry, excessive starchy foods, sweets, etc.

After the course of rest in bed the patient is fitted with a belt to support the lower abdomen. It is a good thing to attach a flat porous rubber sponge to the inside of the belt. The sponge is cut so as to be thick below and thin above. The lower border of the sponge pad should be just above the pubes. After a month or two the belt can usually be discarded. In cases of pronounced downward displacement of the kidney a crescent-shaped kidney pad is fixed to the inside of the belt with a safety-pin. This can usually be much lighter and thinner than the ones ordinarily employed. It is essential that the belt should be kept from riding up by fixed garters or by straps encircling the thighs.

The kind of corset that is much worn by ladies at the present time is quite suitable, provided that it fits well and supports the lower abdomen without constricting the lower part of the chest.

The explanation of the patient's symptoms is probably the dragging that takes

place on the peritoneal attachments of the viscera, especially those of the kidneys, and the kinking of the bowel, particularly the pyloric end of the stomach. The effect of treatment is to shorten and firm up the peritoneal attachments, to straighten out the kinks, and to increase the amount of fat which supports the kidneys and other viscera. The additional support that is given by the improved tone of the abdominal muscles is also a factor.

Whatever be the theoretical considerations involved, the important matter is such cases show a remarkable improvement in health, appearance, and comfort.

Chancroidal Infections.

PEARCE, in the *United States Naval Medical Bulletin* for July, 1921, states that two fairly well defined types of chancroid have been observed by him: (1) A superficial type with a marked tendency to increase of surface area involved, "the creeping type," and (2) the deep type in which the surface area involved is not large but in which there is a pronounced tendency to involve the deeper tissues. Apropos of the latter, one case was observed in which the surface opening was pin-point in size with discharge of a purulent material. Upon passing a probe into this opening a cavity was located, and when the opening was enlarged by incision the cavity was seen to be about the size of a pea or slightly larger, and with the general characteristics of a chancroid—irregular base and walls with discharge. It was on the glands near the frenum, and leading from it was a burrow extending under the frenum.

He has seen many cases of severe chancroidal infections following bilateral slit of the prepuce. These cases were good examples of the superficial type of chancroid, but were very large in area, usually involving the entire flap edges, and were accompanied by extensive edema and inflammation of the flaps. They improved very rapidly under careful and thorough treatment. In this connection he has noticed

that many of the dorsal or lateral slits are made so long that in a later circumcision the mucous membrane has been encroached upon to such an extent that an insufficient amount remains for suture to the skin. It is believed that in most cases these slits are unnecessary if sufficient patience is exercised in the use of prolonged frequent immersion in hot boric or hot magnesium sulphate solutions. When these fail and it becomes necessary to perform the slit, care should be used that it be not extended too far, and the incision edges should be cauterized with nitric acid, the actual cautery, or other similar agent.

In the treatment of his cases a factor of predominant importance, and one that he believes to be essential if good results are to be obtained, was cleanliness of and careful attention to the parts involved. All cases were seen at least once each day by the medical officer and many times during the day by the hospital corpsman in charge.

Two methods of treatment were employed, the method first to be described being used in the larger number of cases, the second method being employed but recently. Their description follows:

In the tincture of myrrh method the penis is carefully cleansed with soap and water. It is then dressed with tincture of myrrh in a strength of one part of the myrrh to eight parts of water. If the lesion is on the corona a small piece of cotton well saturated with the solution is placed in the corona so that it comes into intimate contact with the lesion.

In the small deep lesions a wick of cotton saturated in the solution is packed into the lesion. The penis is then covered with a gauze dressing saturated in the solution. Parchment paper or other impermeable material is then placed over the gauze and the dressings covered with a roller bandage. After the dressing is completed the gauze and cotton are kept constantly moist with the solution. These patients are usually so anxious to have the lesion heal that they need no urging to come to the dressing room frequently for renewal of the solution.

As a preliminary to the above treatment, and sometimes in addition to it, in those cases in which the edema and inflammation are prominent features the penis is immersed for period of thirty minutes in hot magnesium-sulphate solution or hot boric-acid solution at frequent intervals.

Three times daily when the sun method is employed, the penis, especially the part involved, is cleansed carefully with green soap and water, each cleansing being followed by thorough drying.

In the intervals between these cleansings the penis is exposed to the sun's rays, care being used to not continue the exposure to the point where it causes a dermatitis. The only dressing used when treatment is not employed is a covering of gauze.

The results under both forms of treatment were uninterrupted improvement, but the improvement under the "sun" treatment was astonishingly rapid, especially in the superficial type of chancroids.

In conclusion, Pearce believes that the most important factor in the treatment of chancroids is cleanliness, and that where possible to employ it the treatment by exposure to the sun's rays is an extremely efficient method of treatment. He believes that it is not often necessary to perform dorsal or lateral slits of the prepuce, and that in the few cases where it is necessary it should be correctly performed. Where impossible to employ the sun treatment, the treatment with tincture of myrrh solution is of great value.

Treatment of Asthma by Autogenous Streptococcal Vaccines.

ROGERS, in the *British Medical Journal* of July 16, 1921, in concluding his article on this subject, states that in 15 per cent of the cases the treatment failed to give material relief of a lasting nature; in 32.5 per cent great relief was afforded, but it was either not permanent or it was incomplete, and in 52.5 per cent the patients remained well when last heard of, from one-half to four years after the treatment.

Studies on the Consecutive Phases of the Cardiac Cycle.

WIGGERS, in the *American Journal of Physiology* for July, 1921, states that since previous observations had indicated that the duration of systole is not entirely determined by the length of previous diastole, an investigation was undertaken to determine what other factors might be concerned, and the following conclusions were reached:

1. An increase in venous return above normal causes a lengthening of ventricular systole, quite independent of diastole length. This occurs as a result of the prolongation of the ejection phases, the isometric phase of contraction having a tendency to be abridged. Since the initial pressure was always elevated when this occurred, we may formulate the conception that, whether or not the mechanical energy liberated by contraction is fundamentally determined by the initial length of the ventricular fibers at the inception of contraction, the duration of systole, at constant heart rates, varies directly as the initial intraventricular pressure under such a variety of inflow conditions as it is possible to produce in the mammalian heart *in situ*.

2. An increase in arterial resistance acts to abbreviate systole, independently of changes in diastolic length. This abbreviation of systole takes place in spite of a slight tendency of the isometric phase to lengthen, and is therefore due to a shortening of the ejection phase. This shortening of the contraction phase is apparently due, as in skeletal muscle, to the fact that the muscular shortening is terminated earlier by the greater load acting during the process of shortening.

3. When the increase in arterial resistance is of such grade and type that the ventricle cannot empty itself effectively, a marked retention of blood occurs, and the diastolic volume and initial tension increase, in consequence. As such an increase in initial pressure has a tendency to lengthen systole, two opposing influences come into operation in such elevation of arterial resistance, viz.: (a) the tendency of higher

arterial resistance to abbreviate; and (b) the tendency of increased initial tension to lengthen systole. Both factors, no doubt, operate to influence the duration of systole whenever the arterial resistance is increased, but one factor usually predominates. When arterial resistance increases as a result of intense peripheral vasoconstriction, systolic retention is not pronounced and initial tension only slightly increased. Consequently the first factor predominates, and systole decreases. When the aorta is stenosed, the accommodative capacity of the aorta is reduced and large volumes of blood are retained within the ventricle, consequently the initial tension increases very markedly. The second factor then predominates and systole lengthens. When the elasticity of the arterial system or the caliber of the vessels is insufficient to accommodate readily the systolic volume expelled by the ventricles, an increase in peripheral resistance may also act to elevate initial tension and lengthen systole. This explains the lengthening of systole consistently found by Patterson, Piper and Starling in the heart-lung preparation, and we may expect to find such lengthening also in arteriosclerosis involving the larger vessels.

4. The duration of systole is determined solely by changes in the length of previous diastole *only* when the initial intraventricular pressures and the aortic pressure at the beginning of diastole remain nearly constant. Thus we find that, during vagal slowing and during the acceleration subsequent to such stimulation, the duration of systole is predominantly determined by changes in initial pressure, rather than the length of preceding diastole. Again, when slowing occurs in association with an elevation of arterial resistance, as during asphyxia or adrenalin, the duration of systole may be abbreviated through the influence of such higher resistance. There is evidence also that in the case of adrenalin action or stimulation of the accelerator nerves, there is a specific effect on the ventricle which acts independently of these influences to shorten the contraction phase.

5. These observations indicate that not only under abnormal conditions of venous and arterial pressure, but also under such conditions as may be considered quite normal, the systolic portion of the ventricular volume curves cannot be regarded as superimposable at different rates of beat.

6. Since the phases of diastole alter so little in duration, however, during the most diverse conditions of the circulation, it is not possible from these observations to draw the same deductions in regard to the superimposability of diastolic portions of the volume curves.

Repeated Medication for Curing Infections.

Ross, in the *British Medical Journal* of July 2, 1921, states that encouraging results are now being reported in the treatment of various parasitic infections—spirochaetes, intestinal amebæ, plasmodia, Leishmanizæ, piroplasmodiæ, trypanosomes, skin parasites, and even bilharziæ and filariæ. Some years ago all our efforts seemed to be aimed at finding, if possible, some agent which would extirpate the invaders after a single dose, or at the most after a few doses; but we are now observing that the medication must be repeated much more often than we had supposed. Even to-day, however, the number of doses which may be required to produce complete cure remains a very open question, and is discussed only in the light of empirical results, which are often few and not too decisive. It is high time, therefore, to examine the theoretical principles upon which repeated medication may be or should be given.

The best known case is that of malaria. It has been recognized for centuries that cinchona bark or its derivatives will generally reduce an attack or a relapse of malarial fever in a few days, but nothing definite has been laid down as to how long the drug should be continued. When Ross went to India in 1881 the practice was to give the patient 30 grains of quinine daily

(sometimes much less) while the fever persisted and for three days afterwards, and then to discharge him to duty as "cured." He protested against this custom in the *Indian Medical Gazette* for February, 1896, and advised at least one fortnight's treatment in hospital. Later he increased this period to three weeks, but when he himself was infected in 1897 he thought still better of it and took 10 grains of quinine daily for four months; he did not have a relapse. In his lectures, and in his book, "The Prevention of Malaria" (1910), Ross recommended four months', and suggested even six months', continuous treatment. Early in the present century the Indian military authorities ordered six weeks' treatment, with good results. During the war practice varied greatly, the duration of treatment being abbreviated by military exigencies on one hand and prolonged by the issue of prophylactic doses of quinine on the other hand. A period of two months was laid down in 1917 by the War Office at Ross' suggestion (War Office publication, Observations on Malaria, 1919) for men invalidated home.

When Sir Alfred Keogh established a number of special malaria hospitals in the United Kingdom early in 1917 many experiments were commenced with a view to producing complete and early cure, but the results were most disappointing, and relapses occurred in large percentages of the cases after trial of many lines of treatment—intravenous and intramuscular injections of quinine, heroic oral doses, combined methods, quinine with arsenic, etc., kharsivan, and several nostrums which had been commended in medical literature—though, of course, all the lines of quinine medication caused great improvement while they were being given, except perhaps in very rare cases. Thirty grains of quinine daily for three weeks were followed, after stoppage, by relapses in a large percentage of the cases. Even treatments commencing with 100 grains a day and continued for nearly a month in smaller doses gave no guarantee of permanent cure, though they

seemed to yield slightly better results on the average than did the lower scales of dosage. On the other hand, only eight grains daily in four doses appeared to be as effective in reducing fever and parasites, as estimated by careful countings. But five grains daily failed to prevent relapses—even while being taken; and without any quinine at all the patients remained heavily infected and generally became more and more anemic. He concluded, therefore, that eight grains daily or more sufficed almost invariably to improve the cases greatly while being taken, but failed to cure them completely even after six weeks' administration or more. There is much other literature to the same effect. What is the explanation?

By far the most probable theory to account for relapses in malaria is the one described in his book, and studied by D. Thomson and himself. According to this theory the parasites continue to breed in the blood by the known method from the moment of infection until the last of them has died out; but their numbers are always varying greatly. A normal man of 10 stone (64.7 kilogrammes) weight contains (by one estimate) about 3,000,000 cubic millimeters of blood, and, allowing 5,000,000 red corpuscles per cubic millimeter, he should have 15,000,000,000,000 red corpuscles. He estimated that the lowest number of asexual mild tertian parasites able to cause fever was about 100 per cubic millimeter, or 300,000,000 altogether, with a much higher figure for malignant tertian (his cases were old infections). When there is considerable or high fever, the numbers range from about 5000 to 300,000 per cubic millimeter; but in a fatal case in Mauritius, in 1908, he estimated that the parasites must have numbered over a million million. Between the relapses—that is, when there is no fever—the parasites often become too few to be found at all in the small quantity of blood examined (say 1 c.mm.); but even if there be only one parasite per cubic millimeter, that would mean that there might be 3,000,000 in the body altogether. Thomson often succeeded,

however, in finding very small numbers per cubic millimeter even when there was no fever, and these numbers generally increased two or three days before another relapse of fever. Similar variations in numbers of pathogenic organisms are found in other diseases; but, of course, there are certain species of parasites, such as *ascaris*, *uncinaria*, *filaria*, *bilharzia*, which, according to our present knowledge, are not capable of multiplying inside of the body, except by fresh arrivals from without.

What causes variations in the numbers of those parasites which can multiply within the body? Why do they not always maintain a fixed population? Ross believes either that the host's resistance varies or that an overcrowding of the parasite population produces substances injurious to themselves. Perhaps the latter hypothesis may explain the limitation of the parasite population when it has reached a very high figure; but the resistance hypothesis seems necessary to explain the entire extirpation of the invaders, which certainly often occurs without treatment in many diseases, such as malaria and relapsing fever, for example. There may also be some biological law which limits the numbers of non-sexual cell divisions. However this may be, there is much evidence to suggest that unfavorable climatic conditions, fatigue, starvation, excess, or concurrent illness tend to precipitate relapses—at least in malaria. The picture most of us have formed is that while the infection continues there is a constant struggle, with varying fortunes to either side, between the invaders and the opposing forces of the host; and that in hosts who survive the invaders are finally mastered, though, perhaps, not until years have elapsed. There is, he believes, a general mathematical theory that during any constant struggle between opposing forces (for example, between stream and wind) a wave condition of alternating success or failure for either side is produced. The alternating "rallies and relapses" seen in so many diseases, including malaria, seem to suggest this class of phenomena.

By our treatment, then, we are called

upon to help the patient in his fight. We may attempt this either by trying to assist his natural powers of resistance, or by attacking his enemies by specific medication. Many people write as if the former process is the proper one, but unfortunately we really do not know how to assist natural powers of resistance. Keeping patients at rest, "feeding them up," giving them tonics, etc., sound very well, but the patients too often continue to relapse just as before. We have little real evidence to show that people who are in the best of health at the moment of infection suffer less severely when they are invaded by some parasitic infection than do people who have previously been in poor health—rather the converse, in fact. Certainly, he thinks that rest and good feeding help patients to overcome the illness due to parasites. But that is another point; we must not confuse the illness caused by parasites with the parasites themselves; and a patient who is better able to resist the effects of the parasitic invasion does not necessarily possess greater natural power of extirpating the invasion. We are too prone to confuse these two issues. Indeed, experience tends to show that the healthy, vigorous, full-blooded young man is more likely to suffer from very acute attacks than are less healthy people. The obstinacy of infections probably depends chiefly upon unknown natural qualities in the blood or tissues, favorable or unfavorable to the invaders.

However this may be, the clinician is always driven to try some parasitical drug if one be known. If we class specific serums in this category, and possess them for a given kind of infection, we use them for this purpose; but if not, we have to fall back upon other agents which have been empirically recommended, sometimes after great general experience, such as quinine for malaria or ipecacuanha for amebic dysentery. But the question at issue is, how exactly are we to use such drugs?

Apparently most people have usually thought that a few very large doses may be able to destroy all the invaders at a blow—

hence heroic doses both of quinine and of ipecacuanha. But are we so sure of this? There are reasons for thinking that the patient's body is so affronted by the massive dose that it endeavors to cast it forth at once. The studies "On Quinine in Animal Tissues," by W. Ramsden, I. J. Lipkin, and E. Whitley, published some years ago, certainly do seem to suggest that a heroic dose of quinine put straight into the blood is cast out by it almost at once, while a much more moderate dose is likely to remain there longer and to do its work on the plasmodia. Several biologists to whom Ross has mooted the matter are inclined to agree with him in this. The patient's blood and tissues are obliged, so to speak, to protect themselves against any foreign chemical agents as much as against invading parasites. When suddenly subjected to a great dose of something, they adopt the usual course and get rid of it as soon as they can, not being aware that the dose was intended to help them—to speak metaphorically. According to this hypothesis, then, a large dose may possibly be cast out so rapidly that in the end actually a smaller amount of it may reach the parasites to poison them than if a small and more easily tolerated dose had been given to begin with. Probably this accounts for the little difference between the effects of small and of large doses which were observed during the war in the home hospitals. Where Ross found a little difference between the results of say 10 grains a day and 100 grains a day, he suspects that there has been some fallacy in the arguments which led to the adoption of the larger medication.

But another point must now be remembered. Whatever dose be given, are we sure that it will reach all the parasites in the body simultaneously? Perhaps so in certain cases, as in those of parasites which live in open sites, such as the skin and intestines, and are easily attacked by drugs—though even these cannot always be destroyed at once. But how can we expect to obtain such a decisive result in the case of millions of organisms capable of con-

stant reproduction and occupying more recondite positions in the body? We must disabuse ourselves of the notion that the parasites in a host are like fish in a bowl, which can be destroyed all together by mixing a single dose of poison with the water. They must be much more like the enemy on a battle-field, many of whom will escape in their trenches and dugouts the most violent barrage; and, as Ross for one has always thought and taught, there must be many recesses and backwaters of the circulation which, possibly, no medication bearable by the host can reach. This has been ably suggested and perhaps proved by the chemical work just mentioned—especially by I. J. Lipkin's paper. According to it, quinine is concentrated in the suprarenals, kidneys, and spleen; cast out quickly from the lymphatic glands and the blood; and destroyed by the liver and the muscles. If so, even in the quickly moving circulation, large numbers of the plasmodia are likely to escape any dose that we can give, especially in view of the fact that a stasis of them often occurs in certain capillaries. Lastly, if we lift the quinine barrage for a long enough interval the enemy will immediately begin to bring up reinforcements in the form of fresh generations of spores and make good what reductions we had previously succeeded in effecting.

Feeding Infants with the Czerny and Kleinschmidt Butter-flour Mixture.

In the *Archives of Pediatrics* for July, 1921, MITCHELL reports his experience with the butter-flour mixture in 32 infants with the proportions given by Czerny and Kleinschmidt. He states that emphasis should be laid upon the necessity of following closely this method. For convenience he estimated the amounts in tablespoonfuls. Thus it was sufficiently accurate to use 2 level tablespoonfuls of melted butter, 2½ level tablespoonfuls of flour, 1½ level tablespoonfuls of sugar, to 10 fluidounces of water. In whatever way the mixture

was modified, the amounts of butter and flour remained equal. In certain cases he had found it an advantage to reduce the amounts of butter and flour to less than 20 grammes each to 300 Cc. of water. (See original article of Griffith in the *GAZETTE* for November, 1921.)

In some cases the sugar should be decreased in amount or omitted entirely. Again, one to three feedings of butter-flour mixture a day were sometimes given as substitutes for the ordinary cow's milk mixtures which constituted the other feedings, and he had occasionally alternated it with breast feedings, as had been successfully done by others. It is quite simple to manipulate the percentages of fat, carbohydrates and protein in this food as the indications arise, always, however, maintaining the fixed relation of the butter to the flour. Based upon the analysis of Jones, one fluidounce of stock solution might be said to represent 26.6 calories. The mixture containing two-thirds of the stock solution and one-third milk might be said to represent fat 4.6 per cent, carbohydrate 8.2 per cent, protein 1.5 per cent, with a caloric value of 24.6 to the fluidounce. Jones found that the fat of the stock solution after cooking consisted entirely of neutral fat and that no traces of fatty acids were discoverable. Whatever might be the cause of the good results produced by the butter-flour mixture, and whatever the relationship which the volatile acids might bear to this, it is at least certain that the results are good, and that these volatile fatty acids are removed.

The 32 cases in his series were for the most part those who had not seemed to thrive when fed on the more commonly employed simpler modifications of cow's milk. The condition was variously diagnosed as gastrointestinal indigestion, malnutrition, disturbance of balance, dyspepsia, depending upon nomenclature adopted and severity of symptoms. This mixture, like other foods, had its indications and contraindications, and its success in feeding depended upon the proper selection of cases.

The most severe forms of malnutrition, where the tolerance for any sort of food was low, may grow decidedly worse when butter-flour mixture is used. The food should therefore be given cautiously, if at all, to infants suffering from infantile atrophy (athreptic decomposition). Other conditions that might not be expected to respond favorably, nevertheless did so in certain instances. Among these are certain cases of eczema and certain instances of gastrointestinal indigestion in which vomiting is a marked feature. He found that it was the infant whose low body weight was due to failure to properly metabolize sufficient cow's milk who responded most favorably to the Czerny-Kleinschmidt food. In spite of high fat content of butter-flour mixture, vomiting seldom occurred. Of 32 cases, only two had vomiting follow as a marked symptom. The stools were rather characteristic light yellow, resembling a breast-fed baby's stool; odor not offensive but somewhat aromatic; starch was invariably found. Mucus was seldom present; the stools were acid in reaction and varied from one to three in 24 hours.

The gain in weight in infants who thrived upon butter-flour food was usually satisfactory and often wonderful, and in his experience was shown quite promptly. Some gained weight so rapidly that it could only be explained on theory of water retention. Thus one baby gained 7 ounces the first night and 20 ounces in six days. The majority received the treatment for a month or longer. The stopping was usually done because progress was so excellent that it appeared time to send the infant to its home. The food was not difficult for the average mother to prepare. The amount of the mixture fed depended upon the age and weight of the child. Czerny and Kleinschmidt recommended 120 to 200 grammes of food daily for each kilogramme ($1\frac{3}{4}$ to 3 fluidounces per pound), 75 to 90 calories per pound of body weight per day in most of these cases. In most of his cases sweating was present, and as a consequence a condition developed spoken of as "butter-

flour rash." The removal of a baby from butter-flour mixture was not a procedure to be accomplished quickly.

Of the 32 infants fed on butter-flour mixture, 23 responded favorably by gain in weight and improvement in general condition. Digestion was good, vigor of tissues increased, and maximum amount of sleep was obtained. In analyzing histories of nine infants that did not improve on butter-flour mixtures, in seven the type of feeding was not responsible for failure. The two great lessons which his study taught were: (1) that when fed with butter-flour infants might tolerate fat in a manner which could be accomplished probably by no other means yet known to us; and (2) that the truly remarkable results which often follow are a strong proof of the great need which the infant's anatomy possesses for a food containing a sufficiently large amount of fat.

Sodium Bromide Solution in Pyelography, and its Toxicity in Comparison with Other Media.

MERRITT, in the *Boston Medical and Surgical Journal* of July 14, 1921, states that of all the mediums known, collargol is undoubtedly the most commonly used. However, it is known to be injurious to the kidney tissue, and several deaths following its use have been reported. Argyrol, cargentos and argentide have the same action on the kidney tissue as collargol.

In 1919, following Weld's experiments, working in conjunction with Willis of Rocky Mount, N. C., he used sodium bromide in a 20-per-cent solution on three cases. It was known to him that many urologists over the entire country were at that time using his preparation with good results. Willis had previously used this same medium on several cases, and it was at his suggestion that he employed this substance instead of some of the more common ones he had used previously. His results were most satisfactory. The pictures were distinct and clearly outlined. None of the patients suffered any local irritation

or pain, and in no case was there the slightest evidence of any reaction. Following that series he has used sodium bromide in the same strength on four other patients. In every one of these the results were equally satisfactory.

He summarizes his article as follows:

1. It is believed that, of all the mediums in use at the present time in pyelography, sodium bromide is the least toxic.

2. Sodium iodide is the next best medium.

3. Potassium iodide and thorium nitrate have a high toxicity, and the use of these mediums is not to be encouraged.

4. Sodium bromide is non-toxic, cheap, easily prepared, readily accessible, non-irritating, and, at the present time, would seem to be the best medium as yet brought forward. For pyelography, a 20-per-cent solution is recommended. The drug should be chemically pure and sterilized by boiling, prior to use.

Some Aspects of Pernicious Anemia and its Treatment.

HURWITZ, in the *California State Journal of Medicine* for July, 1921, states that although impressions gained from daily contact with the patient are invaluable, we must all admit that they constitute a very unsatisfactory standard, because they permit of the widest latitude to individual opinion. By far more helpful as an immediate index of the value of any form of therapy, as well as a guide to the ultimate prognosis, is the detailed study of the blood reaction in pernicious anemia—that is, the presence or absence of blood features indicating bone-marrow stimulation or depression. This permits us to predict, whether the patient is about to start upon a period of improvement or whether an advance of the disease is imminent, knowledge which makes possible a more precise and a more logical choice of our remedies.

For this reason much attention has been given during the past decade to methods of testing the relative activity of the blood-destroying and blood-regenerating forces at

work in pernicious anemia. Inasmuch as the blood picture at any given period in the disease represents a balance between blood destruction and blood formation, it is possible to obtain valuable information concerning the progress of the disease by determining which of these two factors is in the ascendancy. A single blood examination might not be helpful, but to follow the changes in the blood picture from day to day would tell us how the balance between destruction and formation was swinging, and also how much progress to anticipate from any given treatment.

Because of the hemolytic features of pernicious anemia there has been a tendency to emphasize, for the most part, the clinical and laboratory evidences of blood destruction, and to stress too little the evidences of compensatory bone-marrow activity, which from a therapeutic view-point is of the greatest importance. Clinical observers know well, for instance, that little is to be expected in the way of a marked remission in patients in whom the bone-marrow is inactive or its function greatly disordered. An accurate idea of the functional efficiency of the marrow should be based upon the behavior, not on any one of the elements there produced, but upon a careful interpretation of all the elements of bone-marrow origin. Thus in spontaneous remissions, or in those induced by some therapeutic measure, such as transfusion or splenectomy, satisfactory bone-marrow activity will be shown by an increase over normal of the young red cells (reticulated cells) together with increases over the former low level of the polymorphonuclear leucocytes and of the blood platelets. Inactivity of the marrow, on the other hand, will be indicated by a diminution of the young red cells and by a marked diminution in the polymorphonuclear leucocytes and blood platelets. The latter elements, in particular, have been found by Minot and others to be valuable indicators of bone-marrow efficiency, since transitory alterations in the number of these are less likely to occur than are changes in the polymor-

phonuclear leucocytes. By following the formed elements of the blood in this way, we may obtain a more precise index of bone-marrow function and a better criterion of the value of treatment.

In the absence of more definite knowledge concerning the etiology of pernicious anemia, our best efforts must be confined to combating the symptoms of the disease. Such palliative treatment may rely only upon the time-honored regimen in which rest, diet and arsenic are the essential features, or resort also to the more radical measures of transfusion, splenectomy, and the removal of foci of infection. Notwithstanding that these more radical procedures have been in vogue for more than a decade in the treatment of this affection, we are only now getting more insight into their value and limitations, largely as a result of the painstaking observations of a number of workers in the best clinics of this country. These problems, after all, cannot be settled by the experience of a single observer, or of many observers over a period of many years. And although it is his purpose to dwell more particularly upon the merits of transfusion, splenectomy and the removal of foci of infection, Hurwitz lays emphasis on a few points concerning the simpler therapy at our command.

It seems that many patients with pernicious anemia improve by rest alone. In all anemic states, and more particularly in the severe anemias, absolute rest will relieve patients not only of cardiac strain and fatigue, but make possible besides more rapid blood regeneration; and when combined with a suitable diet, symptomatic improvement may follow even in the absence of other remedial measures.

Particular attention should be given to the diet of these patients. It should be plain, generous, nutritious, and well balanced. And inasmuch as a toxic destruction of protein is known at times to occur in this disease, forced feeding of protein food may produce a more normal nitrogen balance. That such foods exert also an especially favorable influence on the anemia

has recently been emphasized by the experiments of Whipple and his co-workers. They have shown that the curve of hemoglobin regeneration proceeds much more favorably upon a diet of meat protein (beef, liver, etc.) than it does after the ingestion of carbohydrate food (bread, milk, rice, potatoes). The latter, however, as well as the fats, have an important protein-sparing action and help to lessen the excessive protein breakdown which frequently results from the cause of the anemia itself or from the changes it has produced.

It may well be that these dietetic-hygienic measures have been responsible for the improvement noted in many patients whose well-being has been attributed to the use of iron and arsenic. The medical tradition as regards the beneficial effects of arsenic, although very strongly rooted, seems to be weakening as a result of more careful clinical observations. There are those whose experience justifies the view that arsenic has not the hematopoiesis-exciting and anti-hemolytic properties with which its advocates have endowed it. The chief value of arsenic doubtless resides in the beneficial effects which it has upon the metabolic functions, and for this reason it should be given a place in the management of these patients.

The judgment of Hurwitz concerning the therapeutic value of transfusion in pernicious anemia has been based almost entirely upon its usefulness as an immediate emergency measure in tiding a patient over a severe relapse or in inaugurating a remission. Any one who has employed transfusion extensively in this disease can testify to the remarkable symptomatic benefit which at times follows its use; the patients rest more comfortably, eat more, and sleep more. And in those who are not in a stage of disease refractory to any form of treatment, a remission has come on more often when transfusion has been performed. In one series, analyzed by Bloomfield, remissions occurred in 51 per cent of the transfused patients as compared with 28 per cent of

spontaneous remission in those who were not transfused. The duration and character of the remissions, however, were essentially the same whether induced or spontaneous.

The immediate benefit to be derived from one or more transfusions can be foretold to a certain extent by means of the simpler tests of bone-marrow function briefly mentioned before. Any direct evidences of marrow activity, such as definite increases in the number of reticulated cells, platelets, and polymorphonuclear leucocytes, or any diminution in the degree of hemolysis, which points to a more favorable balance between the factors of blood formation and destruction, augurs well for this mode of therapy. On the other hand, older patients, those with a chronic, prolonged course and those exhibiting signs of marrow exhaustion and excessive hemolysis, often fail to respond well to transfusion.

A point of practical importance which should be emphasized in this connection is the fact that patients with chronic anemia may be harmed more than they are helped by such large transfusions (1000 to 1500 Cc.) as some advocate. This observation has been made clinically by Minot and demonstrated experimentally by Robertson. The explanation for this appears to be that the bone-marrow has adjusted itself to the small number of circulating erythrocytes, and the injection of a large bulk of blood may produce a serious depression of the already relatively inactive marrow. In such cases, multiple small transfusions would probably be more desirable than a single large one.

Concerning the ultimate effect of transfusion upon the prolongation of life in pernicious anemia, no definite data are available. From the very careful statistical study of Bloomfield, although based upon a small series of cases, it would appear that transfusion brought about no appreciable increase in the duration of the life of these patients. This observer was able to trace seventeen of twenty-six patients who had received transfusions of blood varying in number from one to seventeen. Thirteen

of these were dead and four were alive, the symptoms in the latter having been present one, two, two, and four years, respectively. Patients treated by the older general methods, however, may also live for a period of four years or longer. Thus Cabot, in an analysis of 647 cases, found 79 patients who lived four years. Transfusion, therefore, cannot be regarded as more curative in the sense that it modifies the duration of the disease than any of the older and simpler modes of treatment.

Although splenectomy for pernicious anemia has been practiced for almost a decade, and has already been abandoned in some of the best clinics of this country, it is well to emphasize that we possess as yet only meager data concerning the effect of this procedure upon the prolongation of life. Its immediate beneficial effects in selected cases cannot be doubted. In patients with clinically enlarged spleens, icteroid appearance, signs of hemolysis, and evidences of active bone-marrow, the results of splenectomy have been remarkably favorable. Splenectomy in such instances not only reduces the red cell destruction as may be clinically shown by the various tests, but it also brings about, by some unknown mechanism, an increased activity of the bone-marrow, with a rise of the reticulated red blood cells, platelets, and polymorphonuclear leucocytes. Beneficial results cannot be expected, however, in patients with an aplastic or an exhausted bone-marrow. When one compares, however, the actual results obtained with the possible results if operation had not been undertaken, the argument for the early employment of splenectomy becomes decidedly weaker. Thus, whereas removal of the spleen may cause a quick and marked improvement in from 64 per cent (Krumbhaar) to 70 to 78 per cent (Minot, Giffin) of the cases, natural remissions occurred one time or another in over 80 per cent of the patients of Cabot's series treated by the older conservative methods.

If, then, splenectomy merely induces a remission, and this is at present the opinion

of the majority of observers, it should be logical to undertake it only as a last resort, when all other measures have proved unavailing, and perhaps with the hope of prolonging life. That the duration of life of splenectomized pernicious anemia patients may actually be lengthened has been very recently shown by Giffin in a statistical survey of the patients observed in the Mayo clinic. In a study of the postoperative life of fifty patients operated upon more than three years ago, Giffin found that ten patients (21.3 per cent) of those who recovered from the operation survived splenectomy three years or longer, and that five patients (10.6 per cent) have survived splenectomy more than five and one-half years and were still living at the time of the report in January, 1921. The total length of the history of these five patients averages about six years, which is clearly longer than the average expectation of life of pernicious anemia patients (four years, Cabot). So that it may be said with reasonable accuracy that, in addition to the immediate remission which occurs with considerable constancy following splenectomy, splenectomy prolongs life in at least 20 per cent of the cases. The hopefulness of this outlook is still further increased by the gradual reduction in the operative mortality from 20 per cent (Krumbhaar, 1917) to 6 per cent (Giffin, 1921).

Pneumo-peritoneal Roentgen-ray Diagnosis.

STEIN and STEWART, in the *New York State Journal of Medicine* for July, 1921, state that much interest has recently centered around the employment of pneumo-peritoneum with roentgenography, as a means of visualizing the contents of the abdominal cavity. This method consists in artificial inflation of the peritoneal cavity, preferably with a definite gas or mixture of gases, preparatory to making the Roentgen examination. The safety and harmlessness of the procedure in skilled hands are so universally admitted as to render it super-

fluous to dwell upon these features, which are naturally essential to the applicability of any diagnostic procedure. As shown by their own observations in nearly one hundred and seventy-five examined cases, and confirmed by the experience of other observers, no untoward results of any kind detract from the value of this simple but highly efficient diagnostic procedure, which has already stood the test of time, and while extremely easy of application, has been found greatly superior to all other methods of examination for the recognition of intra-abdominal lesions of all kinds, especially those involving the solid organs. It is the only method capable of determining the extent of adhesions between the viscera and the abdominal coverings as well as the contents of herniated abdominal walls.

Induced pneumo-peritoneum is equally serviceable for the early diagnosis of peritoneal tuberculosis and for the recognition of the extent of the disease. Localization of projectiles in and beneath the diaphragm is rendered comparatively simple. In fact any subdiaphragmatic lesion can usually be cleared up by this method. It offers good prospects for rendering a positive diagnosis in diseases of the liver and gall-bladder, where the customary methods of clinical and physical examination are often found insufficient. We are now able in many cases to show pathological enlargements, deformities and adhesions of the gall-bladder. Not only that, but in a number of cases they have shown clearly and distinctly large single stones as well as innumerable small stones.

Retroperitoneal growths can also be clearly outlined. An enlarged spleen which has escaped detection through palpation can often be recognized, and changes in the position of the organ be ascertained by means of induced pneumo-peritoneum and roentgenography. Remarkably clear and distinct roentgenograms of the kidney have been obtained with the assistance of artificial inflation of the peritoneal cavity, which also affords accurate information as regards the size and shape of the organ,

besides indicating the type and degree of renal motility. Although the condition of the female pelvic organs can be more or less satisfactorily ascertained by means of the older methods, in the majority of cases peritoneal inflation with *x*-ray examination will probably find an application also in the domain of gynecological diagnosis, in deeply situated abdominal neoplasms. Its constantly increasing range of applicability is characteristic of the method.

As to actual contraindications, the existence of acute abdominal conditions such as acute appendicitis or peritonitis naturally prohibits the employment of the method of abdominal inflation. Nor should this procedure be carried out in known cases of valvular disease of the heart, for more work is required of this organ when the abdomen is inflated than under ordinary conditions. Their experience has shown that a certain type of elderly persons, notably men who have used alcohol in excess, does not readily lend itself to the employment of this method. On the other hand, the average man, woman or child is a perfectly satisfactory subject, and with the adoption of the deflation method the performance of entirely painless inflations will soon become the rule.

In the present simplified technique for the application of pneumo-peritoneal Roentgen examinations, the only accessories required are an ordinary lumbar puncture needle, two sections of small rubber tubing, each measuring about three feet in length, a rubber bag with a capacity of about four liters (such as is used with the gas-oxygen anesthesia apparatus), and a tank containing the gas which one intends to use. One section of the tubing is connected, one end to the tank and the other to the intake of the bag. The second section of tubing is thoroughly sterilized and connected to the outlet of the bag; the apparatus is then ready for application.

The patient is prepared as for any Roentgen examination, by a thorough cleaning out of the bowels and emptying of the bladder just before the inflation. The ad-

ministration of one-quarter of a grain of morphine fifteen minutes before the induction of pneumo-peritoneum is recommended for the simple reason that it dulls the edge of any pain which may arise when the abdomen is distended to its full capacity. In many cases it is not necessary at all, but it is of great help in others, its degree of usefulness varying with the individual temperament.

The needle (properly sterilized) is inserted about one to three fingerbreadths below the umbilicus in the median line. The skin in this vicinity is thoroughly cleansed with tincture of iodine. Existing scars are to be avoided when inserting the needle; a location should be selected where it is reasonable to expect that no adhesions will be encountered. They have found that a local anesthetic before introducing the needle is entirely unnecessary; merely taking a fold of the skin tightly between the fingers is sufficient to counteract any pain on introduction. The needle should be slowly inserted as far as the fascia—the thickness of the abdominal wall being easily gauged by any surgeon, a gentle pressure will then ease it through the fascia and peritoneum into the abdominal cavity. The needle is then connected to the free end of the rubber tube attached to the outlet of the bag, which has been previously filled with the selected gas, a stop-cock at the outlet of the bag is turned on and the gas allowed to slowly pass into the peritoneal cavity—gentle pressure on the bag will sometimes be necessary in order to force in the required amount.

The bag fulfils two purposes: First, it allows full expansion of the gas before introduction into the peritoneal cavity; and second, the gas, having fully expanded, soon assumes the temperature of the surrounding air and becomes more or less warm before insufflated, which is very desirable, although they have never felt the necessity of using any special warming apparatus, nor have they used any method of filtration or sterilization of the gas, believing the less complicated the method the less

danger of infection. So far they seem justified in their contention, having used the method in nearly one hundred and seventy-five cases without any untoward effect.

The question of whether the point of the needle is within the peritoneal cavity is interesting; some authors recommend the injection of a small amount of saline solution, others watch the inflation under the fluoroscope. They have depended more on the tactile sense of the surgeon, who rarely fails to know whether he has entered the peritoneal cavity or not; if there be any question, gentle pressure with fingers is made around the needle, and with the ear near the anterior abdominal wall a slight roar can be heard as the gas enters the abdomen. It is important that this question be decided before much gas is allowed to flow as an emphysema in the extra-peritoneal structures interferes with good Roentgen detail. If the abdominal walls are relaxed, one can "catch up" a fold while introducing the needle; this assists not only the passing of the needle, but raises the parietal peritoneum away from the intestines and there is less danger of puncture than otherwise.

The quantity of gas used depends largely upon the condition of the anterior wall; if there is much relaxation one must use considerable, usually four liters. If one is dealing with a young subject with a firm abdominal wall, about two liters are sufficient. The essential feature is to obtain a moderate distention so that the abdomen is distinctly dome-shaped and the anterior abdominal wall about as tense as the head of a drum. The required amount of gas having been insufflated, the tube is disconnected, the needle quickly withdrawn, and the site of the puncture covered with a small piece of adhesive plaster. The entire method is strictly surgical and should be attempted only by one with surgical experience. The procedure is conducted throughout under modern aseptic precautions.

In selecting the gas to be used, one is influenced by the character of the Roentgen

examination required. If, for instance, the case is one calling for only an examination of the liver and gall-bladder region, or in fact any case requiring a short *x*-ray examination, carbon dioxide is the best, as it will be absorbed in about twenty minutes. It is ideal where quick *x*-ray work can be accomplished, the advantage being that the abdominal tension will have disappeared before the effects of the morphine have worn off. For more lengthy examination, they have successfully used a gas consisting of two parts of CO₂ mixed with one part of oxygen; this is usually absorbed in about thirty-five to forty minutes. For Roentgen examination of the entire abdominal contents, pure oxygen is used; this gas is not absorbed rapidly and gives ample time for investigation, both fluoroscopic as well as roentgenographic, and after the roentgenographic examination the needle can be reinserted and the abdomen deflated.

They have never felt it advisable to leave the needle *in situ* where oxygen has been used, as more danger could be expected from such a procedure than from reinsertion. The Roentgen examination requires the patient to be placed in so many different positions that a retained needle would be more liable to traumatize the peritoneum, if not occasion a puncture of the intestines.

Intestinal Tuberculosis.

BROWN and SAMPSON, in the *New York State Journal of Medicine* for July, 1921, state that when diarrhea is absent, medicines are of little avail. Drop doses of creosote in a capsule, with one-quarter grain iodoform, may be tried after meals. Salol and Tully powder, 2.5 grains of each, every four hours, may have to be resorted to in terminal cases.

The *x*-ray may not reveal the whole extent of the involvement. Patients with advanced pulmonary tuberculosis do not do well and should not be operated upon, nor should those with advanced intestinal lesions, except to relieve symptoms. In early localized cases, excision is the operation of choice, but it may be necessary to

short-circuit, which in advanced cases may make the condition and symptoms worse.

Treatment by sunlight or the mercury quartz lamp often relieves the symptoms in a striking way and produces both clinical and radiological changes that are remarkable, but inasmuch as a few cases recover without any treatment, judgment of the value of this treatment is difficult, and these results may not be attributed entirely to the ultraviolet ray. These methods should be used in all cases whether or not subjected to operation.

Diagnosis and Treatment of Diphtheria.

In the *Lancet* of July 9, 1921, THOMSON touches upon the main points in the treatment of acute diphtheria; apart from suitable nourishment, these are adequate dosage of antitoxin and complete rest in the recumbent position. All other treatment falls into insignificance beside them, and any treatment which interferes with them is bad. We know that within a certain time antitoxin will stop the production of toxin, but we cannot say just how long that time may be; possibly it varies in different individuals and in different degrees of severity. There is evidence which goes to show that antitoxin neutralizes or partly neutralizes the toxin in circulation, and that larger doses may partly neutralize toxin loosely combined with the cells, but not that which has become fixed. We do not know at all exactly when the toxin commences to be circulated in quantity; we do not know how long it is in circulation or how long it is loosely combined. The deductions appear to be that the earlier one can treat the disease the better, and that if one fails to get the patient early the dosage should be greater; this is in accord with clinical experience.

At one time it was laid down, and, indeed, is still held by some, that the weight of the individual should regulate the dose. This at first sight seems reasonable, but the child is more susceptible to diphtheria than the adult, and the net result is that the

child requires as large a dose as the adult. It is true that infants are often insusceptible or less susceptible to diphtheria, but that point can hardly be held to affect the general rule of dosage. The method of administering the antitoxin affects the dosage to some extent, but the main points affecting it are the severity of the attack and the stage of the disease. It is, however, very difficult to estimate the dosage in any given case, and the only safe method appears to be to err purposely on the ample side.

To arrive at the approximate dose one has to be guided by the stage of the disease, the rapidity of progress from the onset of the symptoms, the amount of membrane, the amount of inflammation and edema, the amount of glandular swelling, the amount of cellular infiltration; whether the nasopharynx is involved, as indicated by nasal discharge; the character and amount of the nasal discharge, and whether it is blood-stained; whether there is bleeding from the mucous membranes, and to what extent; whether there is hemorrhage into the skin, and whether there are subcutaneous hemorrhages; whether the larynx is affected as well, and the throat fetor. One must not be guided by the amount of membrane alone, as sometimes happens; Thomson points out that early in the most serious cases there may often be no membrane. Having thus arrived at the probable dosage it is wise in all severe cases to add, say, 4000 units more to cover possible error.

The accepted methods of administration are the subcutaneous, the intramuscular, and intravenous. The intravenous method, while having its advantages, need hardly be considered for routine purposes. Rolleston advises the intramuscular chiefly because the absorption is more rapid than by the subcutaneous method. In his opinion, also, the intramuscular method is preferable and the injection is best made deeply into the vastus externus. Some inject into the gluteal region, but as Rolleston points out the thigh muscles are more compact and exercise greater pressure and so help the more rapid absorption of the injected fluid.

Further, it is to be remembered that the patient has to lie on the gluteal region, and there is no need to add to his discomfort.

Rolleston advises the following dosage: For severe faucial cases: 16,000 to 20,000 units, and a similar or sometimes smaller dose on one or two of the following days. For moderate faucial cases: 8000 to 12,000 units, occasionally repeated on the following day. For mild faucial cases: 4000 to 8000 units, repetition rarely being necessary. For nasal, laryngeal, conjunctival or aural diphtheria in which there is no faucial involvement: 4000 to 12,000 units.

Ker states that in diphtheria cases are frequently met with in which a single dose of 10,000 units is not enough, and that in not a few cases there is no improvement until the patient has received more than 20,000 units. Further, he says that in severe nasopharyngeal cases it may be necessary to give 40,000 units or more. He believes that for some mild faucial cases 4000 units is sufficient, but there is the difficulty in gauging the class of case one is dealing with. This can be done with some accuracy by those of much experience, but is very difficult for others. Personally, Ker does not care to give less than 6000 units, and he advises all those who are uncertain that the case is really a mild attack never to give less than 8000 units.

It is well to remember that we do not know very much about the accurate dosage of antitoxin; but we do know the patient will recover if an adequate dose of antitoxin is given sufficiently early in the disease. Thomson refers to the wonderfully good results obtained by MacCombie amongst patients treated on the first day of the disease; he believes that he never gave less than 12,000 units. It is impossible to say what the maximum necessary dosage is in the most severe cases. He has seen cases in which more than 50,000 units seemed necessary. Ideally the amount of antitoxin necessary should be administered in one dose, but it is very difficult to estimate the quantity and so second doses are often required. It is desirable that the second

dose should be given not later than twenty-four hours after the first; repeated doses extending over a few days are not to be recommended.

If one has not erred in one's estimate of the severity of the attack, as indicated by a definite increase in symptoms in twelve hours after the injection, many cases will not require more antitoxin. In mild faucial cases second doses will seldom be necessary. In moderate faucial cases some will require second doses of from 8000 to 10,000 units. In severe faucial and severe faucial and laryngeal second doses of from 12,000 to 16,000 units will be required in a goodly number.

In many very severe faucial cases second doses, usually varying from 16,000 to 20,000 units, will be required, but occasionally it will be advisable to repeat the first-day dose in twenty-four hours or less if the faucial swelling and cellulitis have increased, and to give a second dose of 20,000 units should there be no improvement by that time. Cases suffering from laryngeal diphtheria with no faucial or nasal involvement seldom require more than 18,000 units. Nasal diphtheria with membrane but no faucial involvement, and conjunctival diphtheria with no faucial involvement, seldom require a second dose. A discharge from the nose, whether blood-stained or not, in which is found the diphtheria bacillus but no membrane formation, seldom requires antitoxin treatment.

[We think it is safer to use antitoxin in these nasal cases.—Ed.]

The Capillary Pressure and the Circulation in Shock.

HILL and McQUEEN, in the *Lancet* of July 9, 1921, remind us that Hill has demonstrated the fact that the capillary channels in the body are never all filled. If an armlet be placed on the upper arm and pressure applied just below the systolic level the large veins of the arm below the armlet will rapidly rise to the systolic level of pressure pertaining in the brachial artery

while the capillary pressure is still much lower than systolic pressure. Hill deduced from this experiment that (1) the capillaries that have blood in them are capable of taking up much more blood by dilatation; (2) there are numerous capillaries in the body not filled at all; (3) there are anastomotic channels whereby pressure is easily and quickly transmitted between small arteries and the veins.

All of these conclusions have been amply proved. Bayliss found that after section of the spinal cord large volumes of gum saline solutions could be injected and remain in the vessels with persistent dilution of the hemoglobin; evidently here capillaries distend and formerly closed capillary channels open. The capillary field becomes a huge reservoir of diluted blood. Hill finds that direct anastomotic paths between small arteries and veins are visible on examination of capillary fields. It has been repeatedly noted in cases of shock that the red blood cells in venous blood taken from the arm often numbered 2,000,000 corpuscles fewer per c.mm. than in blood taken from the capillaries. In the old view of the circulation of the blood passing by way of arterioles through capillaries into venules and veins it is obvious that the venous counts and capillary counts should agree closely. But if, as Hill has long maintained, and now shown by examination of capillary fields under the microscope, there are these short and direct paths between arteries and veins, we should expect that the high red-cell count pertaining in these capillary areas in which there is slow flow or stasis would not obtain in the direct paths through which arterial blood flows with its lower red-cell concentration, hence the venous counts would be uniformly lower than the capillary counts. It is noted that as shock diminishes the capillary and venous red-cell counts approximate in value. In normal individuals greater differences than 3 per cent between capillary and venous counts did not exist. It is obvious here that in these anastomotic paths we have the factor on which depends the possibility of restor-

ing stagnant blood in the capillary area into circulation. If no such anastomotic paths existed the slowing of the blood current in the capillary area would uniformly lead to concentration so great that little or no blood would be in circulation at all.

Surgical shock would kill with an effect and rapidity similar to anaphylaxis in the guinea-pig; or injection of histamine in the etherized cat, when the blood in the capillaries and veins ceases to flow, as can be observed under the microscope. In surgical shock blood slowly concentrates in the capillary area, and the return blood to the heart is a mixture of blood of more normal concentration passing by the direct anastomotic channels and concentrated blood returned from the capillaries to the veins. The phenomena of shock supervene gradually and the removal of shock is equally gradual; viscosity of the blood in the capillaries may be overcome by dilution with other blood (donors) or gum-saline mixtures and the pressure in the arterial tree raised through the injection; both factors tend to remove stagnation. The blood diluted with donor's blood or gum saline has the easy path of return to the heart via anastomotic channels, and is not compelled, all of it, to force its way through capillaries that are already choked with concentrated blood. The approximation of venous red-cell and capillary red-cell counts is correctly interpreted as proof of the removal of stasis. But if there were not in existence these free anastomotic paths it is extremely doubtful if such removal of stasis could take place. The primary cause of the capillary stasis is the fall of the arterial blood-pressure below the critical level of 80 mm. of Hg or so, and the fact that the fall is not temporary as in the case of fainting. Whether in shock the products absorbed from damaged tissues or the sensory stimulation preceding it is the cause of this prolonged fall in the arterial blood-pressure below the critical level we cannot judge on the available data. However, the fact that with a normal arterial systolic pressure of 130 mm. of Hg the kinetic energy of

capillary blood flow is but a fraction of a few millimeters means that this fraction becomes less with a falling blood-pressure, and may be still less with a general vasoconstriction in the arteriole area. The general capillary field is sacrificed to the arterial pressure in the brain and in the heart, and a sure Nemesis awaits that method of restoring blood-pressure if carried too far. Deoxygenation sets in in the capillary area, the osmotic pressure of the tissue cells rises and these imbibe more fluid, the capillary wall may suffer and become increasingly permeable. The viscosity of the concentrated blood increases. The kinetic pressure available in the capillary area, already a small fraction of a few millimeters of Hg, is inadequate to maintain the blood flow, and the heart, so carefully shielded from oxygen want by vasoconstriction elsewhere, finds itself with progressively less and less blood to propel.

The value of gum-saline solutions or of normal blood from a donor is obviously due to the fact that the heart is fed directly from the vein into which the solution is run. The pressure rising in the main arterial system is transmitted to the capillary area, but the gum-saline with its viscosity equal to normal blood, or the donor's normal blood, dilutes the concentrated blood in the capillary area, restores it to a more normal viscosity, reoxygenizes the tissue cells and the capillary wall, and prevents the increasing loss of fluid by imbibition and permeation.

In shock when the blood-pressure falls below 80 mm. Hg it is possible, as pointed out by MacLeod, that the reciprocal innervation, by means of which vasoconstriction in one area is compensated by vasodilatation in another, acts in a faulty manner. It is possible that a profound general vasodilatation occurs in the initial stages, but such vasodilatation, while it lowers the general level of arterial blood-pressure, might not decrease the kinetic energy of the blood flow in the capillaries. But when arterial vasoconstriction sets in later, and blood is trapped in distended capillaries, and capil-

laries open that formerly were shut, then the kinetic energy of the capillary flow becomes altogether insufficient to propel the blood.

The accurate measurement of capillary blood-pressure then throws light on stasis. Low arterial blood-pressures are dangerous because the capillary kinetic energy of blood flow is very small even with normal arterial blood-pressure. There is a very small margin of safety in the capillary area.

The Law of the Heart.

STARLING, in the *Lancet* of July 23, 1921, states that by a careful observation of the changes in the heart we may arrive at some clue to the nature of the pressure, but more accurate methods are necessary if we are to be certain of the correctness of our guess. We must under these varying conditions measure: (1) the pressure in the heart cavities produced at each contraction; (2) the volume of the heart cavities—*i.e.*, the length of the muscle fibers of their walls. The first he measured in the experiment described by connecting the interior of each cavity in turn with a quickly acting manometer, the excursions of which are registered by an optical method so as to avoid the instrumental vibrations of a lever. The curve of pressure obtained under two conditions—*i.e.*, low and high artificial resistance—could then be plotted. It must be remembered that the heart was sending on in each case all the blood that it received, though the work necessary under the high pressure was two or three times as great as that necessary to send on the blood at the low pressure. To measure the volume of the heart the ventricles are enclosed in an instrument known as a cardiometer. This communicates with a piston recorder, so that the change of the volume of the ventricles at each beat can be registered on a moving surface.

The question to be decided is, how does the heart know when it is relaxed that at the next contraction it will have to exert more force than it did previously, when the

arterial resistance to be overcome was lower? If we measure the pressure in the ventricles in the manner just described we find that during the period of relaxation of the ventricles the pressure in its cavities is approximately zero, whether the artificial pressure which it has to overcome at its next beat is 50 or 150 mm. Hg. It is not, therefore, the tension on the walls of the heart which determines the strength of its contraction at its next beat. When, however, we come to measure the volume of the heart, we find that in the isolated heart this is directly proportioned to the work which the heart has to accomplish. Thus we find that the larger the heart—i.e., the more it is dilated during diastole—the greater is the pressure that it will get up at the succeeding contraction or systole.

This may be put in another form, as is shown by continuing the experiment over several hours, when it is found that the worse the condition of the heart muscle, the more it must dilate in order to get up an adequate pressure. Other things remaining equal we thus see that the volume of the heart during diastole is a measure of its physiological condition, and we are not surprised that a failing heart means a dilated heart. Of course, there is a limit to this power of adaptation. As the heart dilates it is working at an ever-increasing mechanical disadvantage, and a point will finally arise at which this disadvantage more than counterbalances the physiological effect of dilatation. The heart then dilates widely and fails to empty its contents. Dilatation of the heart means elongation of the muscular fibers composing its walls, so that we may put the law of the heart in another way and say that the longer its muscle fibers the greater is the energy developed at each contraction. But in this form this wonderful power of adaptation possessed by the heart becomes part of the general properties of all muscular tissues, since the same rule applies to the fibers composing our voluntary muscles.

Can we obtain any more precise and physiological conception of what is involved in this relationship between length of fiber

and strength of contraction? Microscopic examination of the fibers, either of the heart or of voluntary muscles, shows that these are composed of innumerable fibrils, so that internally the muscle fiber is made up of structures presenting an enormous extension of longitudinal surfaces. The more the muscle is stretched the greater will be the extent of these surfaces. A large amount of evidence, based on the electrical and chemical changes occurring in muscle as a result of excitation, points to the contraction as being essentially a surface phenomenon—a molecular change over the whole of the longitudinal surface which may result in a polarization or depolarization of its service and an increase of its surface tension, so that the muscle is a surface tension machine in which there is on excitation a direct conversion of chemical into surface energy. The greater the surface the greater will be the number of molecules involved, so that increased length of muscle must increase at the same time the total chemical changes and the total tension produced by the summation of the surface tension of each fibril.

It is only by such a change of molecular dimensions that we can explain the rapidity of events in a muscle (the insect wing muscle can contract and relax 300 times per second), or the high efficiency of the machine, an efficiency which A. V. Hill has shown may amount to 100 per cent for each isolated contraction, and over a length of time to 50 per cent.

Prolonged Intolerance to Carbohydrates.

HOWLAND, in the *Archives of Pediatrics* for July, 1921, states that it is now generally appreciated that sugars initiate and perpetuate diarrhea and are capable of doing a great amount of harm. Many children with a prolonged sugar intolerance have a tendency to diarrhea even when taking woman's milk. It is apparently the sugar and not the fat that is responsible, as is suggested by a diet deficient in carbo-

hydrates, which is borne even though it may contain a considerable proportion of fat. The disturbance in such patients is usually attributed to something else than the peculiarity of the individual. A more important condition is the prolonged intolerance that develops after severe diarrhea, especially after numerous attacks of diarrhea. The first indication here is to reduce the sugar to its lowest limits in a food which furnishes the other requirements for adequate nutrition. Nothing can compare with protein milk in this respect. It allows the presence of fat, protein and salts with minimum of disturbing sugar, and it furnishes the substances necessary for the formation of insoluble soaps.

Carbohydrates must be withheld for a long time. A polysaccharide, such as farina, is not only at times well borne but may even have a marked constipating effect. Young infants will usually not tolerate this. With older infants it may be strikingly successful. These forms of carbohydrate intolerance are confined almost entirely to the first two years. Another form, perhaps the most striking and certainly the most persistent, occurs in children of all ages. It is commonly known as chronic indigestion or as intestinal infantilism of Herter. Theories as to the causation of this condition are hard to substantiate. At present we may theorize but not prove.

One may speak of the treatment with more assurance. It has been found that of all the elements of food carbohydrate is the one that must be rigorously excluded. The dietary treatment may be divided into three stages. First, that with protein milk alone. From experience with more than 30 such patients it can be said that, more than any other food, this is likely to bring satisfactory results. It is preferable to buttermilk on account of its somewhat higher caloric value, and especially because of its far lower sugar content. How long the protein milk stage should be continued depends upon the intestinal reaction and somewhat upon the age of the child, but usually is a matter of days or a few weeks. It should

be continued until the stools are firm, distention very slight, gas not in excess, and appetite good. The diet in the second stage consists of protein milk as a basis reinforced by almost pure protein foods. These may include curd without any whey, scraped meat, certain forms of cheese, egg-white, and eventually whole egg. The duration of this stage is many months; it may be years.

This is not an ideal diet, but it is an adequate diet. A child may take such a diet for a long time with nothing but benefit and with a continued gain in weight. With this diet there is enough sugar to guard against acidosis and no danger of lack of vitamins. Vitamine A is supplied by the fat of protein milk, which is for this reason to be preferred to buttermilk. Vitamine B is supplied by the whey of the buttermilk, and the antiscorbutic factor can be given in the form of orange juice or tomato juice. In the third stage carbohydrates are added very gradually, with most careful observation of the digestive capacity. Bread, cereal and potato are the last articles that can be allowed. The treatment is time-consuming, but these patients well repay the effort expended upon them. They do not remain invalids, but become vigorous and strong.

Psychotherapy of Tuberculosis.

NEALE, in the *Pennsylvania Medical Journal* for July, 1921, states that we should not be discouraged if the patient loses heart, but start again on new lines; keeping always before the patient the probability of recovery. The opinion of the patient should not be disregarded but listened to, and gradually, if possible, one can create new ideas if the ones he has seem pernicious. His character and his way of reasoning is to be studied. If he is taciturn and gloomy, give him something to think about that will lead his thoughts into some other field of speculation, and if he has a fixed idea as to the efficacy of some plan of treatment, allow him to believe that it will be put into effect when the proper time comes.

In concluding his article Neale says that of late years it seems to him we have been growing altogether too scientific (or think we are), too much given to the belief that medicine is a positive science and that all diseases can be reduced to an absolute scientific certainty, in diagnosis, prognosis, and treatment, if we are only sufficiently scientific to carry out these deductions in a strictly up-to-date manner. We are practically told all this by the so-called leaders in modern medicine, but he is sufficiently old-fashioned to be not quite certain of that fact, and like the man from Missouri he "wants to be shown." There can be no mathematical calculation in this question; too much depends upon factors not seen or thoroughly understood. Too much science and too little common sense often lead us far afield, and as not one of the many books upon psychotherapy makes clear the method of application of these principles, it is hardly to be expected that one can point out any positive course to follow that will suit every individual. It seems to Neale a question for any one who recognizes the value of psychotherapy to apply in his own way. We all use it, more often unconsciously than otherwise; but if he has awakened sufficient interest to lead others to attempt to follow out treatment along these lines he is content. Once understood and put into practice, often the most surprising and gratifying results will be observed.

The Clinical Value of Intraperitoneal Injections of Salt Solution.

GITTINGS and DONNELLY, in the *Archives of Pediatrics* for July, 1921, state that in the treatment of dehydration seen so frequently in children suffering from gastrointestinal disorders with diarrhea during the summer months they had found that the most efficacious means of introducing fluid was by the use of the nasal tube, or by intraperitoneal injections. The other methods were either too painful or allowed the introduction of insufficient amounts of

water. The intravenous route possesses certain dangers and might well be reserved for the introduction of solutions of glucose or glucose acacia. The nasal tube was preferable to the stomach tube, as being less likely to cause vomiting. It should only be introduced well beyond the epiglottis and not through the cardia. This also seemed to be less apt to cause regurgitation. From 150 to 250 Cc. of water could be introduced two or three times in twenty-four hours, from three to three and a half hours after the last feeding. Intraperitoneal injections seemed to be safe provided the bladder was empty, the abdomen was not distended, and the fluid was introduced slowly. The amounts to be used vary usually from 150 to 300 Cc., the optimum to be judged by the subjective and objective symptoms. Disturbance of respiration and pulse and increasing distention indicate withdrawal of the needle. One hundred and sixteen patients received 352 intraperitoneal injections of normal saline. Comparison with the mortality showed that the oldest cases and those having the highest weight on admission had the greatest proportion of recoveries. The mortality increased *pari passu* with the number of injections, being the highest in those receiving ten or more. Dehydration was determined upon the degree of the loss of resiliency in the skin and subcutaneous tissues, when pinched into a fold.

According to this criterion those with the least resiliency showed the highest mortality, and *vice versa*, although in some cases the dehydration was entirely relieved without preventing the fatal issue. Autopsy upon nine of the patients showed that no injury had been done to the peritoneum or any of the abdominal structures. The authors concluded that the forced ingestion of water by nasal tube deserved a more extensive trial; that 300 Cc. probably represented a maximum for intraperitoneal injection in any infant under one year of age, and that smaller amounts administered more frequently were safer for infants weighing less than 4000 grammes.

Route of Administration of Drugs in Relation to Toxicity in Chemotherapeutic Investigations, with Special Reference to Intrapleural Injections of Ethylhydrocuprein Hydrochloride.

KOLMER, in the *Journal of Pharmacology and Experimental Therapeutics* for July, 1921, summarizes his article as follows:

1. Ethylhydrocuprein hydrochloride, other quinine compounds, mercurophen, arsphenamine and neoarsphenamine are 0.6 to 0.7 times more toxic for white rats by intrapleural than by intravenous injection.

2. Ethylhydrocuprein hydrochloride and mercurophen were about 7 to 8 times more toxic for rabbits by subthecal injection than for white rats by intravenous injection.

3. Ethylhydrocuprein hydrochloride, other quinine compounds and mercurophen were 3 to 4 times less toxic for white rats by intraperitoneal injection than by intravenous injection; arsphenamine and neoarsphenamine were 1 to 2 times less toxic.

4. Ethylhydrocuprein hydrochloride, other quinine compounds and mercurophen were 10 to 16 times less toxic for white rats by subcutaneous injection than by intravenous injection; arsphenamine was 2 times less toxic, but neoarsphenamine was 0.5 to 1 time more toxic.

5. The toxicity of ethylhydrocuprein hydrochloride by intravenous injection to mice, rats, guinea-pigs and rabbits was quite uniform, the highest tolerated doses being 0.03 to 0.04 gramme per kilogramme of weight. Toxicity by subcutaneous injection varied from 0.500 gramme per kilogramme in the guinea-pig to 0.600 gramme per kilogramme in the mouse and rabbit.

6. The toxicity of arsphenamine and neoarsphenamine by intravenous and subcutaneous injection varies with the test animal, the highest tolerated doses being observed with mice, next with rats and rabbits in the order named.

7. There is no constant or uniform relation among the highest tolerated doses of different compounds for animals of the same species with the same route of admin-

istration. In very general terms a compound is apt to be about 8 times more toxic by subthecal than by intravenous injection; 0.6 to 0.7 times more toxic by intrapleural, 1 to 4 times less toxic by intraperitoneal, and 2 to 16 times less toxic by subcutaneous than by intravenous injection.

Needed Measures for the Prevention of Deafness During Early Life.

In the *Journal of the American Medical Association* for July, 1921, HAYS states that the vast amount of harm that is done to ears during the exanthematous diseases, particularly measles and scarlet fever and meningitis, has seemed to be fully recognized. The ears of the children are well taken care of during the acute stages of the disease, and remedial measures are at once used. But what happens after the acute condition subsides? How many of these cases are properly followed up after the patient leaves the hospital? Yet if one glances over his histories of progressive deafness later on in life, he finds that frequently there is a history of the trouble having arisen during or after one of these three diseases.

Meningitis with deafness often means that the nerve has become affected or that there has been some intracranial affection, and the condition frequently manifests itself at the time of the disease and so is given hopeless attention. But in scarlet fever and in measles there is either a residual process left or there is a continuation of the catarrhal process which forms part of the disease. The acute inflammation has subsided or the suppuration has ceased, and at the time the impairment of hearing is so slight that it passes unnoticed. But certain adhesive processes are left which mean permanent impairment of hearing—processes which he believes could often be remedied, if taken in time. There are some who feel that the hearing defect is caused by toxic processes during the disease; but there are others of us who are convinced that the deafness is due to neglect of the

local trouble after the child leaves the hospital.

Every parent who takes from the hospital a child who has suffered from one of these contagious diseases should be advised to consult an ear specialist at once, and if there is the slightest impairment of hearing, every care should be taken to bring it to normal as soon as possible. Hays has sufficient data on hand to know what can be done in this way, and all of us have sufficient data in our histories of progressively deafened patients to realize that something more should be done for these cases than is done at present.

He indicates the kind of treatment that may be employed to prevent deafness. He has not taken into account the child who has been found to be suffering from slight impairment of hearing by either the teacher, the parent, or himself. A child of school age is usually a sensible child whose hearing can be properly tested and whose ears can be properly treated. There are two factors which are of a great deal of importance in such a case. Invariably such a child has some form of nasopharyngeal obstruction which should be corrected, or else he has been blowing his nose improperly. In former papers he has spoken of pocket-handkerchief deafness. This results in a relaxed ear drum, which is an exceedingly difficult condition to treat. Children should be taught to blow their noses properly and not to use them like trumpets. Only one nostril at a time should be held, and if air is felt to force itself into the ear then, the nostrils should not be held at all.

Naturally, in preventive treatment, one must eliminate all causative factors either in the nose, throat, or ear, or in the general system. Next of importance is the proper massage of the drums at regular intervals. The Eustachian tubes of children are far more widely open than they are in adults, and proper politzerization is a simple procedure when one has once gained the confidence of the child. It is amazing to see the vast immediate improvement in the hearing of these children after careful

politzerization. A medical vapor should be used in the Politzer bag or the connection between it and the nasal attachment. He has frequently seen hearing, which was zero to the watch before treatment, return to normal after the treatment and remain so for a considerable length of time. The treatment will have to be frequently repeated, particularly after the child has had a severe cold. However, a word of warning should be given here. Too strenuous treatment of children's ears will result in more harm than good. Careful judgment must be exercised in every case. He hesitates to say that he has seen the hearing made worse by overtreatment, but such is the fact. Catheterization is a very difficult and often dangerous procedure in children, and it is wise to feel that a tube which cannot be dilated by inflation through the Politzer bag is a tube which is suffering from a pathologic obstruction which needs more attention than inflation. Aside from the above mentioned procedure, one may make use of a mild massage of the drum by means of a Siegel otoscope or an electric otoscope attached to an electric massage apparatus. The massage should never be given with sufficient severity to cause any engorgement of the drum.

Section of Cervical Sympathetic for Angina Pectoris.

In the correspondence columns of the *British Medical Journal* of July 23, 1921, appears the following note from SIR CLIFFORD ALLBUTT:

"Jonnesco's operation of division of the vagus, mentioned by Starling and others, for the relief of angina pectoris is very interesting to me, as in 1893, at a branch meeting of the Association at Yarmouth, I published my hypothesis that in say 90 per cent of cases the malady was due to aortitis, and that death was due, not to 'heart failure,' but to vagus inhibition—both propositions then made for the first time. Since then I have prescribed atropine—as advised in my book on arterial disease

—to protect the heart from the inhibition. When the heart is sound it escapes from the vagus grip; but in the large majority of the cases the heart is not sound.

"My purpose now is to say that Professor Wenckebach of Vienna wrote to me some months ago to say that he had completed his five-hundredth necropsy on cases of angina, and that he was 'absolutely with me' as to my interpretations of the disease. He added that he had found in many of the severer cases that the vagus in the neck was tender to pressure, sometimes very

tender; so much so as to make it desirable that stiff or tight collars should be removed.

"My hypothesis is now widely accepted in France and in the United States, but hardly yet in England. Indeed, a few years ago a dear friend of mine argued with me that it was a 'childish opinion,' and advised me for my own reputation's sake to say no more about it. That notwithstanding in a small minority of cases the angina arises in or about the heart I set forth and described in my *Arteries* book."

Surgical and Genito-Urinary Therapeutics

The X-ray After Inflation of the Pelvic Cavity.

PETERSON (*Surgery, Gynecology and Obstetrics*, August, 1921) states that the pelvis has been inflated with gas in over 150 cases with no reaction that could be attributable to the gas itself, or the method employed. He holds there is no danger of injuring the intestines by the needle thrust through the abdominal wall where the intestines are not adherent to the parietes.

There is very little discomfort incident to the procedure. The average patient will complain of discomfort about the lower abdomen when about 400 or 500 Cc. have been introduced, and may complain very bitterly after the introduction of more than 1000 Cc.

Discomfort is increased in the presence of chronic pelvic and abdominal inflammation, also by rapid injection. In half an hour the patients walk about the examining room and leave the hospital without any discomfort. The transuterine route is contraindicated in acute and subacute pelvic conditions. The best results are secured by the moderate knee-chest position, with an inclined board beneath the thighs and a notch cut out for the tubes.

The uterus together with the tubes and ovaries can be clearly shown by pneumoperitoneal roentgenography.

Owing to their distention with gas the tubes are rather more clearly demonstrated by the x-ray where inflation has been brought about through the transuterine route than where the inflation has been made transperitoneally.

On account of the rapid absorption of carbon dioxide gas with equally rapid subsidence of the discomfort produced by the inflation, this gas should be used in preference to oxygen, which is very slowly absorbed.

Irregularities of the uterus, omental and bowel adhesions are clearly demonstrated by the pneumoperitoneal x-ray.

In not a few instances the diseased and enlarged appendages are more clearly made out by pelvic roentgenography than by the most careful and searching bimanual examination even under anesthesia.

With the improved position (knee-chest and Trendelenburg) smaller and smaller quantities of gas will be necessary for inflation. Thus discomfort will be reduced to a minimum.

If the technique of pelvic roentgenogra-

phy be good, retention of bowel coils in the pelvis will be proof of adhesions.

The pneumoperitoneal x -ray is able to demonstrate pregnancy at a much earlier period than is possible by the examining finger.

With good technique and good judgment in the selection of cases both transuterine and transperitoneal gas inflation are free from danger.

Bimanual pelvic examination and pelvic pneumoperitoneal roentgenography are not antagonistic diagnostic methods. Each is valuable, and their value is enhanced if they be used in conjunction, each acting as a check upon the other.

Intussusception.

PERRIN and LINDSAY (*British Journal of Surgery*, July, 1921) contribute a monograph based on 400 cases collected from the London Hospital records of admissions during the eighteen years from 1903 to 1920. Only the first seven cases admitted during 1920 have been included.

In seven cases no operation was performed, and these all died. In 309 cases of laparotomy with reduction 22 per cent died. In 29 cases of resection with anastomosis by clamps 68.9 per cent died. Laparotomy, attempted reduction or anastomosis, sewn up—all died. Resection with Paul's tube—all died. Resection with Murphy's button—all died. A similar result followed with Paul's tube alone and with no operation.

As a rule after reduction convalescence was rapid and uneventful. In the whole period of eighteen years there were 400 cases, with 139 deaths, giving a mortality of 34.75 per cent.

A gratifying feature of the mortality is that beginning with a death-rate of 56.7 per cent in 1903 to 1905, this steadily fell to 17.9 per cent in 1915-17, and rose again to 39.1 per cent in 1918-20.

From 1903 to 1917 the steady improvement in the statistics is probably due mainly to increase in the number of doctors avail-

able for attending the population around the hospital, and possibly also to improved education. It must be remembered that rectal injections as a treatment for intussusception have only ceased to be carried out in the last twenty years, and thus after this date there must have been many practitioners surviving who from early training failed to appreciate the need for early operative intervention. With the passage of time their views would have gradually changed until the present attitude of mind would have been universally reached, in which any child with diarrhea and vomiting is regarded with a suspicious eye as a possible sufferer from an acute intussusception. The regrettable increase in the mortality during the last triennial period, 1918-1920, is probably due to the extensive withdrawal of doctors for the army during the latter part of 1917 and early months of 1918. This has probably righted itself at the time of writing (December, 1920), but the more favorable statistics of 1920 have not made themselves felt, for they are not completely incorporated in this last triennial period, as only the first seven cases admitted in 1920 are included in the series in order to keep the total number considered at the round figure of 400.

The Present Status of Radium and Roentgen Therapy.

In a leading article in the *International Journal of Surgery*, July, 1921, this question is thus discussed:

Unless the people are fully informed as to the present status of radium treatment in malignant disease, they may gain erroneous impressions that may prejudice them against early resort to radical operation. Undoubtedly much has been accomplished with radium in the removal of the more superficial cancerous lesions of the skin and mucous membranes as evidenced by the numerous complete and permanent cures that have been recorded. It is equally true that it has rendered immense service in inoperable cases of deep-seated carcinoma by

relieving pain, arresting discharge, and prolonging the life of the patient. According to a large number of published observations, advanced cases, in which surgical intervention appears futile, have been so greatly improved under its use as to permit of operation. Notwithstanding all this, it cannot be justly claimed that radium can successfully replace the knife in deep-seated malignant growths which are still within the operable stage. It will, however, prove a most valuable adjunct to surgical intervention, since by its systematic use before and following operation the chances of recurrence are materially diminished.

A question of great practical importance, which is still far from having been definitely settled, is the relative merits of radium and the x -ray in the treatment of carcinoma. Each of these agents has advantages of its own. Frequently by their conjoined application better results are secured than by the use of either alone. Where it is necessary to exert an intense and deeply penetrating action over a small area, radium will be given general preference. It can also be applied to internal organs or within cavities which are inaccessible to the x -ray or may be buried in the tumor mass. It can be easily carried about and requires no elaborate apparatus. On the other hand, the yield of radium is so limited and its extraction so costly that comparatively few physicians can afford to purchase it. Its use is, therefore, largely restricted to hospitals and other institutions, and many of these have been unable to secure an adequate supply. This difficulty has been overcome to a certain extent by the employment of tubes and other appliances filled with the emanation, but this necessitates the acquisition of large quantities of radium, at least one-half gramme, at a cost which is within the reach of but a small number of private institutions. As has been repeatedly emphasized, to obtain satisfactory results from radium, it must be employed in sufficient quantity, for if used in too small an amount it may stimulate the proliferation of the cancer cells rather than cause their destruc-

tion. Furthermore, it cannot be too strongly urged that thorough and extensive experience and a complete mastery of the complicated technique are indispensable requisites in successful radium therapy. Work of this kind should therefore remain in the hands of experts, else serious discredit may be thrown upon this method of treatment.

There is no reason, however, why, in spite of its many advantages, radium should supplant the x -ray in the various conditions in which the latter has been found of distinct value. The recent improvements in Roentgen apparatus and in the Coolidge tube warrant the hope that the penetrating power and the intensity of the x -ray will be greatly increased, so that it will become possible to subject even deep-seated organs and tumors to the radiations. For many years certain types of uterine fibroids have been successfully treated with the x -ray, and in spite of the brilliant successes with radium in more recent years its superiority over Roentgen therapy in this field has not been definitely established. This also applies to the treatment of glandular enlargements, exophthalmic goitre, leucemia, Hodgkin's disease, and various cutaneous affections. In fact, where large surfaces must be submitted to radiations it is probable that the x -ray will prove more generally efficient, especially if the supply of radium remains so limited.

Suspension Operation for Varicocele.

KEYES (*International Journal of Surgery*, July, 1921) comments on an operation devised by a former resident, Dr. U. C. Vincent, as follows:

The principle consists in nothing more than the suspension of the testicle by its pampiniform plexus of veins to the external oblique aponeurosis. The object of this suspension is twofold—in the first place the patient likes to see his testicle lifted up higher than its fellow, having usually been greatly distressed to note that it was lower. In the second place many of these patients complain of all sorts of dragging discom-

forts in relation to the testicle, and we have found that this discomfort is relieved by suspending the testicle to the external oblique through its veins, thereby taking all the pull off the vas deferens and surrounding structure.

This is the only operation that actually relieves the discomfort associated with varicocele. The procedure is simple enough. Under local anesthesia a rather short incision is made centering over the external inguinal ring. The veins are identified, their sheath is split, and they are carefully separated. The veins are then divided and the upper end doubly ligated. The lower end is pulled upon, and as it is pulled the fascial adhesions are stripped away from it until the testicle is seen to rise to the upper half of the scrotum. One then estimates how much slack will be needed to hold the testicle close under the pubes, estimating the leaving of it very high in the scrotum, since subsequent to operation the veins will gradually stretch and the testicle sink down at least an inch lower than it is left at the time of operation.

At this point the veins are again cut, and just below the point of cutting transfixed and doubly tied with chromic gut suture. Then with the blunt end of a pair of scissors, or the handle of a knife, the intercolumnar fascia is separated and this blunt instrument run under the aponeurosis of the external oblique for 3 or 4 cm. upward along the inguinal canal, separating the cremaster fascia from the inner surface of the external oblique. Then each end of the ligature that has been used to tie off the lower bit of vein is threaded separately on a needle and run into the inguinal canal and out through the external oblique in such a way that when drawn tight and sutured the veins are pulled up within the canal for the distance of at least an inch. With the tying of this suture the operation is concluded, excepting the sutures necessary to close the skin.

One feature of this operation that is not to be neglected is the fact that it never causes hydrocele.

Fracture of the Skull.

BUTLER (*California State Journal of Medicine*, July, 1921) reports on 280 cases of brain injury diagnosed as fractures of the skull, treated in the San Francisco Emergency Hospital during the year 1920. Of this number 139—to-wit, 50 per cent—of the cases are incident to automobile accidents.

The nearer the pulse and respiratory rates approach the extremes, the more grave the prognosis.

Temperature was normal or subnormal in all cases upon entry.

One hundred and five patients were unconscious upon entry; one hundred and thirty-five were semiconscious, and forty were sufficiently clear to give their names and addresses.

Hemorrhage from the ear or ears was recorded forty-eight times. Discharge of pulped brain material from the external auditory canal was noted in three cases. The progress of cases having hemorrhage from the ears was more favorable than was that of those of apparently equal severity where bleeding was not present.

Nine of the fractures were depressed, and seven of these resulted from falling objects.

Twenty-nine of the two hundred and eighty cases were distinctly alcoholic. Alcohol is more of a factor than these figures would indicate. Frequently the person operating the automobile is intoxicated, but there is no record of it.

All intoxicated persons having head injuries are treated as serious cases and never allowed to leave the hospital, except under the care of a physician.

Head injuries in old people are never to be regarded lightly, even if they may appear very insignificant upon entry. Many lapse into coma, and death may rapidly follow. This may be explained by the inelasticity of the skull and the senile changes in the cerebral vessels.

Location of brain injuries is governed by the force of impact, whether or not the

head is in motion. If the head is in motion and strikes some solid object or material, as telephone pole or pavement, the brain will be injured directly beneath the skull at the point of impact; also a more extensive injury takes place on the opposite side of the brain.

If the head is not in motion and is struck by some moving object, such as a falling brick, the brain injury is located directly below the area of impact.

The most valuable and reliable localizing sign as to the side of compression has been the state of the pupils. The pupil on the side of the beginning compression reacts very sluggishly, often showing a hippus. As compression increases this pupil slowly contracts, reacting at first, later fixed, and finally dilates slowly, followed by the same course of events in the other pupil.

In an extradural hemorrhage from branches of the middle meningeal, with the dura intact, this pupillary phenomenon may take twelve to seventy-two hours, or even longer, to go through the various stages. The reflexes, superficial, deep, and pathological, spasticity and paralysis, are of value, but they are more changeable and unreliable where the injuries are multiple.

In case, for example, having a direct injury in the right parietal-temporal region, with tearing of the anterior or posterior branch of the middle meningeal, and a contrecoup contusion and laceration of the cortex, the reflexes and paralysis would probably indicate the contrecoup injury, but the pupils would give evidence of the increasing extradural clot on the right and, along with properly interpreted x-ray, would indicate the location for decompression.

Operation is not indicated: (1) In brain injuries so extensive that all reflexes, superficial and deep, are suspended. (2) When the pulse is above 110, if the rapid rate is due to shock alone; given time it will slow down and then decompression may be performed, if indicated; if due to destruction of brain the pulse continues to become more rapid, and any operative interference would only hasten the end. (3) When all

the signs of compression develop very rapidly, for example, in thirty minutes to one hour. (4) Medullary edema manifested by rapid pulse, respiration, and rising temperature.

Operation is indicated: (1) Depressed fractures. (2) Any case of gradual increasing cerebral compression, regardless of whether it is due to extradural hemorrhage, intradural hemorrhage, or parenchymatous edema. (3) Any case showing definite irritative or paretic signs.

Postepileptic coma, often because of the presence of recent scalp injury, is at times mistaken for fracture, with brain injuries. Cerebral apoplexy in cases that have had recent scalp injuries, and comas, uremic, diabetic, or narcotic poisonings, are likewise an occasional cause for confusion.

Treatment consists in complete rest in a quiet, dark room, head and shoulders elevated, ice-cap to head, heat to extremities.

Various Operative Procedures Indicated by Goitre.

BARTLETT (*Journal of the Missouri State Medical Association*, August, 1921) states that four different types of operation may be indicated. These are selected according to the severity of the case, and may be studied under three separate headings, which he indicates as (a) the form of operation, (b) where performed, (c) the anesthesia used.

1. Hot-water injections or peripheral ligations are reserved for the sickest patients, who are always rested in bed for a considerable time before doing anything of an operative character. Such operations are invariably done in the patient's room in order to minimize the risk of moving, and the psychic shock incident to the operating-room surroundings. Local anesthesia is always used. The tissues are infiltrated with one-per-cent novocaine solution, in which of course no adrenalin is employed on account of its well-known property of stimulating thyroid secretions.

2. One lateral lobe is removed in patients who are considered well enough to stand a very few minutes of radical surgery, but

this is done in clinic through a lateral incision, along the anterior border of the sternomastoid. The wound is left wide open, and in many instances clamps are left in place in order to save the time ordinarily spent in making ligations. This operation is invariably done in the patient's bed, for the reasons previously given. Local anesthesia is always employed since it is adequate for all purposes and distinctly safer than general.

3. Both lateral lobes and the isthmus are in great part removed through the collar incision, which gives the ideal cosmetic result, but the wound is left wide open, to be closed a day or two later in any one of the many ways which are adequate. This third class embraces patients who are hardly well enough to be considered normal risks, and in whom unfortunate surprises might follow any damming up of the wound secretions, hence the open neck. Such patients are always taken to the operating-room, since they are not particularly sensitive to psychic stimuli. Local anesthesia is always used for the reasons given in the other instance.

4. In this group lie all the simple goitre patients who have no systemic goitre symptoms. An almost complete removal of both lobes and isthmus is made through the collar incision, which is entirely closed without drainage, since they are not sensitive in any way nor exposed to the danger of postoperative hyperthyroidism, even if the cavity from which the goitre is removed be not completely dry. Such patients are always treated in the operating-room, since there is no reason for our not availing ourselves of its conveniences. Either local or general anesthesia may be used according to the individual operator's preference.

One who studies the metabolic rate, makes the Goetsch adrenalin test, does repeated blood-pressure and leucocyte determination, will in the course of time build up an instinct for classifying these patients more or less correctly.

As to the unilateral procedure in order to get a tumor by the shortest possible route,

an incision is made just behind the anterior portion of the sternomastoid muscle, and parallel to it. This divides skin and platysma, after which the sternomastoid muscle is retracted outward sufficiently to uncover the ribbon muscles, which are split longitudinally, without any cross-division of their fibers. One is astonished at this point to learn how nearly retraction can be dispensed with in displaying the growths, the patient being thus saved much of the discomfort which makes for shock and postoperative symptoms. The lobe is well isolated and the entire defect flooded with alcohol, which seals up the lymphatic spaces and thus does much to prevent the absorption of toxic thyroid juices. The upper pole is divided; the stump is quickly clamped off bite by bite and divided. The clamps may be left in place in order to save the time ordinarily spent in ligating, and the wound held wide open by them, thus conserving the time which would otherwise be spent in closure, at the same time guaranteeing uninterrupted drainage with almost certain prevention of postoperative thyrotoxicosis.

The employment of this simple procedure guarantees one against the imputation of endangering the patient's life by doing too much, and reduces the gravity of a thyroidectomy to little more than that of ligation, in the doubtful class of cases in which it is so difficult to predict the outcome of an operation.

A neck which has been left wide open after a thyroidectomy is more comfortable than one which has been sewn up, although this will perhaps not impress the surgeon who has not employed both methods.

A postoperative therapeutic measure which is of the greatest value in quieting a patient, and bringing down the temperature, is the ice pack, which Crile proposed about one year ago.

The clamps are not touched as long as there is any evidence of postoperative storm. One is astonished upon removing the clamps to see the slit in the ribbon muscles close spontaneously when their function is assert-

ed, to see the sternomastoid muscle slip back into place over the defect just mentioned, and to find that one may draw the skin almost together with adhesive straps, although there is a tendency for the lips of the last-named structure to curl inward.

The removal of the second side through an incision which is the counterpart of that on the first side can be made within a few days, but has also been postponed until the patient has made the gain in health which is characteristic of destruction of half a thyroid gland. The secondary operation, if at a remote date, can of course be performed with every refinement of detail, since it will have no emergency aspect, and after it is completed the skin wound on the first side can be excised and a secondary suture made.

The Thyroid.

CHARLES MAYO (*Medical Record*, July 30, 1921) observes that Kendall in his work used three and one-half tons of the thyroid gland of pigs and is finally able to express in chemical terms the secretion of the thyroid. The clinical work of Plummer and the metabolic work of Boothby, based on Kendall's studies, made it possible to determine the amount of thyroid secretion in an average gland and in an average body, and the length of time that the amount in the body would functionate after the removal of the gland.

Mayo states that at Rochester 25,000 thyroids have been operated upon or treated medicinally when operation seemed inadvisable. He notes that there were about three cases of goitre to each 1000 draft recruits in the district of New York, seven cases to 1000 in the Great Lakes region, eight or nine cases to 1000 in Montana and Idaho. The incidence of exophthalmic goitre, three to 1000, as noted by some western draft boards of the army, is too high for men in the third decade, since most exophthalmic goitres occur in women.

The soft goitres of adolescence respond to treatment with sodium iodide and thyroid

extract, although the treatment required may sometimes be prolonged. In this relation the experimental work of Marine may be mentioned. In Akron, Ohio, Marine administered small doses of sodium iodide to three thousand school-girls in a certain area. He found that fewer among this group developed changes in the thyroid than among a similar group to whom no treatment was given. Simple goitres are not uncommon in young persons. Later in life nodular encapsulated adenoma may develop on fetal tissue with colloid, or there may be various degrees of calcareous and fibroid changes; a cystic degeneration is rarely toxic.

The epinephrin test may produce dangerous reactions, and a large percentage of cases might lead to wrong conclusions. Many psychoneurotic patients would be placed with the group of patients having exophthalmic goitre on the basis of the epinephrin test. On the other hand, a failure in diagnosis is almost impossible if the basal metabolic rate is taken into consideration with other general symptoms. Patients with simple goitres occasionally have slightly low metabolic rates of -8 to -10 , but as a rule the basal metabolic rate must be lower before definite symptoms of hypothyroidism are manifest, as in myxedema. The edema of myxedema in primary hypothyroidism appears quite definitely as soon as the basal metabolic rate falls below -16 or -17 . In the treatment of myxedema by thyroxin the appearance and disappearance of the edema can be noted from variations of three points in the basal metabolic rate around -17 , and in a period as short as three days. The statement that the removal of thyroid tissue may be extensive and complete without producing myxedema and symptoms of thyroid insufficiency is not supported by the metabolic rate tests on patients after radical or nearly complete removal of the gland.

Substernal goitre is more common than was supposed. Sometimes its presence is indicated by the veins on the neck extending down over the chest, showing the obstruction to the venous flow. This type of goitre

is frequently well encapsulated and can be easily enucleated, especially if the patient coöperates by a little cough. In order to have the advantage of the coöperation of the patient, operations on goitres of this type should be performed under local anesthesia.

Syphilitic goitre is not very common, and sarcoma is rarer than carcinoma. A group of over 200 patients with malignant tumors of the thyroid has been operated on at the Mayo clinic, and in addition the condition of nearly a hundred patients examined was found to be hopeless and operation was not advised.

Treatment with the x -ray and radium has been used in the Mayo clinic to some extent. The x -ray produces so much connective tissue that the gland will require knife section if operation becomes necessary. The x -ray probably has a beneficial effect on the thyroid and might give relief for a period of time; however, a certain number recover, anyway, without treatment. Such severe scarring has followed x -ray treatment in a number of cases that the patients were willing to submit to a skin-grafting or any other procedure that promised to remove the scar. The x -ray is also dangerous in that it might produce a complete destruction of the gland. One patient came to the clinic with cancer of the skin over the gland caused by long x -ray treatment.

Patients with exophthalmic goitre pass through exacerbations of symptoms which are largely influenced by psychic stimuli, and they are easily exhausted. At this period the patients should be treated medically, not surgically. If necessary, ligation, x -ray treatment, and hot-water injections may be given in conjunction with absolute rest. Rarely the hot water, not hot enough, probably, made the condition worse by diluting the secretion; the water should be boiling. The injection of quinine urea has not proved of sufficient benefit to be worth while. A basal metabolic rate of plus 85 or plus 100 may fall to plus 35 or plus 40 if the patient is placed under rest and treatment; this may, however, be but a ficti-

tious improvement. A patient with a metabolic rate of plus 56, who has survived a recent exacerbation and is improving, is a safer risk than a patient with a rate of plus 46 who is on the rising wave of exacerbation. Ligation should be performed under local or nitrous oxide anesthesia. Most patients can be operated on under local anesthesia.

With modern technique and methods the mortality in exophthalmic goitre has greatly decreased, probably due more to early operation than to the advances in surgery.

In operating on a patient with a large goitre a transverse incision should be made through the skin and platysma and in the line of the folds in the skin of the neck. The trachea is then exposed, but should not be dissected too freely or congestion and temporary loss of voice or hoarseness will follow on the second day, with recovery later. A primary division of the isthmus should be made with a turning out of the lobes from the trachea in large goitres, as recommended by Balfour. In exophthalmic goitre double resection largely avoids repeated operation; otherwise a small percentage of cases might require a second operation, perhaps at the end of two years, and some might require a third operation.

Twenty-one Years' Experience with Cæsarian Section.

WILLIAMS (*American Journal of Surgery*, August, 1921; quoted from *Bulletin of the Johns Hopkins Hospital*, June, 1921) based his analysis upon 188 Cæsarian sections performed up to December 31, 1920.

The operations were done in a series of approximately 20,000 deliveries, and comprise 104 single and 79 repeated sections. The latter were done upon 41 women, 34 of whom had two, and seven three sections each.

Although the number of white and black patients in the service was approximately identical, many more Cæsarian sections were done upon the latter—114 to 69, while 30 to 11 required repeated sections.

The following types of operation were done: 121 typical conservative sections; 4 extraperitoneal sections; 1 post-mortem section; 57 Porro sections.

The gross mortality was 5.46 per cent, but, upon deducting cases in which death was not attributable to the operation, the net mortality was 3.45 per cent; or 4.07 per cent in the conservative and 1.82 per cent in the Porro sections. All deaths, except one from hemorrhage, were due to infection.

The mortality was thirteen times greater in the first 50 than in the last 133 cases—10 to 0.77 per cent. This remarkable diminution was not due to changes in operative technique, but to the avoidance of ascending infection by operating before the onset or during first hours of labor.

The conservative section late in labor is always dangerous, even if vaginal examinations have not been made; while the Porro section is relatively safe. The most important means of lowering the mortality of conservative Cæsarian section due to disproportion is by learning to determine before the onset of labor whether the operation will be required or not.

The Porro operation is relatively safe even in infected or exhausted patients, as the absence of the involuting uterus hinders the spread of infection. Disproportion due to contracted pelvis was the indication for interference in nine-tenths of the black and in six-tenths of the white patients.

The several varieties of rachitic pelvis afforded the predominant indication in the blacks, as compared with the simple flat pelvis in the whites.

The most frequent non-pelvic indications were eclampsia and serious cardiac decompensation.

Cæsarian section is not the ideal treatment for eclampsia, and is indicated only in the rare instances in which the cervix is rigid and undilated and venesection has not led to improvement.

It is likewise only rarely indicated in placenta previa. But one section was done in 66 cases, and insertion of the rubber balloon is regarded as the best treatment.

Generally speaking, the patient should be sterilized at the third section, either by amputating the uterus or by an operation upon the tubes.

Abdominal incisions are made below the umbilicus, as this permits amputation of the uterus or operations upon the appendages, when necessary, without extending the incision.

The uterus should be incised *in situ*, and eviscerated before incision only in the presence of infection. Experience indicates that in normal cases the latter procedure increases the incidence of infection.

The uterine incision should be sutured in layers, and the greatest care taken to insure the closest approximation of the peritoneal margins.

The uterine cicatrix ruptured once in 48 women with repeated sections, as well as in 12 deliveries through the natural passages subsequent to section. The frequency of its occurrence is probably exaggerated, so that the dictum "once a Cæsarian always a Cæsarian" is not necessarily correct. On the other hand, the possibility of rupture must always be faced, and it constitutes the strongest argument against the unnecessary employment of Cæsarian section for non-pelvic indications.

The placenta was inserted upon the anterior wall of the uterus in two out of every five cases. Consequently it is frequently involved in the uterine incision. This has no other significance than a momentary gush of blood.

The delivery of an asphyxiated child occurs less frequently than is generally believed. Somewhat over one-half of the children cried immediately after delivery, and only 7 per cent were deeply asphyxiated.

Notwithstanding the extraordinary value of pituitary extract in stimulating uterine contraction, pronounced atony with danger of death from hemorrhage is still to be reckoned with, and necessitated amputation of the uterus in two of the patients.

Uterine adhesions were absent in one-quarter of the repeated sections, and were extensive in one-third of them. They are

not necessarily the result of infection, as the puerperium was normal in 36 per cent of the cases in which they developed. In many instances they appear to be associated with imperfect approximation of the uterine wound or with other traumatic factors.

The old superstition that boys originate from the right and girls from the left ovary can be definitely discarded. In two-thirds of the patients the corpus luteum persisted until the end of pregnancy, and its location bore no relation to the sex of the child.

Finally, it should be remembered that Cæsarian section is not devoid of danger, and is relatively safe only when done under appropriate conditions before the onset or during the first hours of labor.

As the uterine cicatrix constitutes a *locus minoris resistentiæ* in subsequent pregnancies, Cæsarian section for other than pelvic indications should be performed only when absolutely necessary. It is the writer's conviction that the operation is being abused throughout the country, and if accurate statistics as to its results were available it would be found to be accountable for many unnecessary maternal deaths. It should be recognized that although it is frequently the easiest manner of delivering the patient in the presence of abnormalities, it is not always the safest, and that ideal results are obtained in only a few clinics.

The Radiation Treatment of Hypertrophied Tonsils.

OSGOOD (*Boston Medical and Surgical Journal*, July 28, 1921) bases his observations on a series of cases treated both in clinic and in private practice, not selected and with no regard to the type of tonsillar disease.

Filtered radiation in suberythema dose was used. The areas treated should include the skin immediately over the tonsils, and adenoid area if desired. All other parts are protected by lead-foil in such a way that any radiation which could reach them would be negligible. It was found that a series of three or four such treat-

ments, given at an interval of two or three weeks, was sufficient, in the average case, to produce a definite atrophy of the hypertrophied tonsil in a period varying from six to nine weeks after the administration of the last treatment. The raggedness disappeared, and the surface became smooth and shiny, in practically all the cases. Many of them show a definite clinical improvement after the second treatment. The tonsil itself is not actually removed, but decreases to about one-fourth its original size.

Many cases of tonsillectomy, where the tonsil tissue was entirely removed at an early age, have later resulted in a compensatory hypertrophy of the neighboring lymphoid tissue of the oral ring, resulting in a so-called recurrence, or in a granular throat.

Conservative x -ray treatment may eliminate this undesirable feature. It should be borne in mind, however, that the action of the x -ray on the tonsils is purely on the lymphoid tissue. There is no sterilization of the bacteria or direct action on the material in the crypts. The result obtained is a mechanical one, in that with the shrinkage of the lymphoid tissue the crypts open, and the surfaces become smooth, thereby evacuating the caseated material and mechanically eliminating the bacterial infection. It is possible by this method of treatment to avoid hemorrhage, the discomfort and loss of time of operation, and the pulmonary sequelæ which frequently occur after tonsillectomy in the adult.

With the dose and method used it is safe and reasonably sure in cases of hypertrophied or chronically infected tonsils with hypertrophy, where the infection is due to bacterial lodgments in crypts formed by overgrowth of lymphoid tissue. It is especially indicated in those cases in which operation is deemed inadvisable or must be delayed because of cardiac or pulmonary complications. The disadvantages are chiefly the time required to obtain final results and the necessity for the selection of suitable cases. It should be understood, however, that radiation treatment in its present stage is by no means a replacement of sur-

gery. There are many types of cases, as, for example, the atrophied, chronically infected tonsils, the abscessed tonsils, etc., which are obviously unsuited for x -ray therapy.

Much has been said about the x -ray dangers over the neck. These dangers are (1) the possibility of x -ray dermatitis; (2) the possibility of other than lymphoid tissue being affected by the ray; (3) the possibility of late degenerative changes in the skin.

In answer to the first objection, it should be recalled that the dose given in the average case is much less than that required to produce an erythema of the skin. The risk in the hands of the expert radiologist is no greater than that which the patient undergoes at the hands of the expert laryngologist.

It is true that the sensitiveness of the skin to x -ray varies with the age, younger children being more susceptible than adults, but this is taken into consideration in estimating the dose to be administered. The dose is measured in physical factors, which may vary for different types of x -ray machines. It is obvious, therefore, that the operator should have sufficient experience with his machine to judge its limitations, and the variations in the factors used to calculate the erythema dose. If the treatment of tonsils by x -ray is left in the hands of a trained radiologist accustomed to the use of his equipment, the possibility of dangers from x -ray burn is remote.

Degenerative changes in the skin occurring several years after treatment, in case of prolonged radiation, have been observed in thyroid patients even where no record of a definite erythema had been noted at any time. In the treatment of tonsils, however, the dose is much smaller than that which was found to be safe over the neck. The fewer number of treatments with the smaller doses required are well within the limit of safety even for very young children. It is further possible, by subdividing the dose into a large number of applications, to reduce still further the possibility of skin atrophy, or telangiectatic changes.

Sacroccocygeal Dermoids.

STALEY (*Minnesota Medicine*, Volume IV, No. 7, 1921) comments on the rarity of these tumors, and observes that they often give no trouble at all till communication is established between the cyst and the skin. Thereupon irritating discharge continues until the affected area is excised. Cysts in this location have been mistaken for other conditions, among which are the various infections of the bones, including tuberculosis and pyogenic infection. The external opening of the fistula may be close to the sphincter ani, and in that one respect resemble the sinus of perirectal abscess.

In addition to the simple dermoids there are several more complex tumors occurring in this region which are the result of misplaced fetal remnants. The literature concerning those anterior to the sacrum has been well reviewed by Law and by Lund. Those posterior to the sacrum are classified by Ewing as simple dermoids, complex dermoids, teratoid tumors, teratomas, and fetal implantations.

The largest specimen removed was the size of a hen's egg, the smallest the size of a marble. The tissue was hard, grayish-white in appearance, and of approximately the consistency of cartilage. The masses were not encapsulated, the indurated tissue merging with the surrounding soft parts.

The condition is seen most frequently in young adults and in otherwise healthy individuals. In the nineteen cases collected by Mallory the average age was twenty-one years.

The fistulous opening when single is usually in the midline. It may be below the tip of the coccyx and close to the external sphincter. When found in that location the fistula may easily be mistaken for the sinus resulting from perirectal inflammation. The openings may be multiple, one above the other, or the tracts may extend outward from the midline under the subcutaneous tissue of the back or buttocks. Of the above mentioned cases collected by Mallory, 4 of the 19 had two or more fistulæ.

In some cases there may be a large area of inflammatory tissue with many sinuses, and closely resembling tuberculosis of the sacrum. It may not be possible to determine the character of lesions in such cases before operation, when normal serum is found to underlie the mass of inflammatory tissue.

When one considers the pathology of the condition, which is that of a tube lined by epithelium extending from the surface of the skin into a mass of chronic inflammatory tissue, it is evident that anything in the way of treatment except complete excision will not be effective. After passing a probe into the fistula it should be dissected out down to its termination. Then by means of the finger-tip the indurated areas are identified and completely excised. The wounds in the four cases above reported were partially closed with silkworm-gut sutures; a drain was inserted between the sutures.

Control of Chronic Pain.

DYAS (*Surgery, Gynecology and Obstetrics*, August, 1921) observes that current medical journals are full of accounts of operations designed to restore the lagging functions of youth and are read with avidity by both the medical profession and the laity. Possibly the reaction from the destructive processes of war has stimulated an effort upon the part of the writers to conserve life to the uttermost and to make procreation, even by the senile and by the abnormal, the great aim of the investigator.

While these attempts to stretch the span of life beyond the allotted three score years and ten and to restore the waning power of the sexual glands are worthy of admiration, there are some problems of a nature so practical and so pressing that there is some excuse for directing our energies away from the more alluring search for the fountain of youth. Among these is the urgent need of a method for the accurate and scientific control of chronic pain, especially that due to recurrent inoperable malignancy. The intractable pain of tic-douloureux stimulated attempts to give

relief to the sufferers by a method less hazardous than the surgical removal of the Gasserian ganglion, which had an operative mortality of 50 per cent in the hands of the most experienced operators. To this end avulsion of the ends of the branches of the trifacial nerve, as far as possible beyond their foramina of exit, was practiced with temporary relief. This plan was succeeded by the injection of the nerve trunks by 2-per-cent osmic acid. Relief was obtained by this plan for varying periods, but it had the disadvantage of being extremely irritating to the surrounding tissues and frequently caused necrosis when the injection was not accurately made into the nerve sheath.

Injections of alcohol of varying strength have proved satisfactory in a large number of cases of facial neuralgia and have produced analgesia for a period of six to eighteen months. Thus the efforts to short-circuit the painful area in facial neuralgia constitute the first accurate, scientific, and safe method of combating chronic pain.

It seemed possible, therefore, to render other areas analgesic in which the paths of pain conduction were accessible to the injecting needle. If it is possible to perform almost any type of operation under local anesthesia, why should it not be just as feasible to render any given field painless for a greater length of time?

While the material at hand did not give an opportunity to test out a great many areas, the results achieved in the cases treated at least justify a more extended application of the principle, *i. e.*, local anesthesia for the relief of chronic pain.

As the experimental and clinical data have not been sufficient to render an exhaustive report, this paper is presented rather as a preliminary study than as a complete work. The possibilities of mastering pain in hopeless conditions of malignancy was the incentive under which this work was undertaken. Every surgeon has seen cases of malignancy in which apparently none of the older methods gave relief. The woman with recurrent carcinoma of the breast, rocking constantly to

and fro with the pain, is not an uncommon patient in any large hospital. The dread picture is familiar to us all, and yet so far no work has been undertaken for its relief. Many persons have no fear of death, yet who does not dread pain?

In many situations chronic pain may be controlled by interrupting the paths of pain conduction by the methods in vogue in local anesthesia. The scientific accurate control of the pain will do much to rob the course of hopeless malignancy of its horrors. The mental anguish may remain, but the somatic suffering in most cases can be spared to the patient. The relief of constant pain revives the drooping spirits of the sufferer and enables him to put on weight and to gain in strength. The time-honored but inefficient attempts to produce an euthanasia by the administration of ever-increasing doses of opium or other narcotics must give place to a procedure which is efficient and which preserves the individual as himself to the end.

The short-circuiting of the painful area is accomplished by nerve-blocking in the form of neurectomy or of intraneural injection. In relatively small superficial malignant lesions the same end may be accomplished by the healing of the ulcer by radium. This is especially true of lesions about the orifices of the body. Nerve-block relieves the pain during the period of healing.

The agents used for intramural injection are numerous, and it is probable that no single drug is suitable to all cases. Chronic pain due to some condition other than malignancy is perhaps best treated by salt solution, novocaine, apothesine, or quinine and urea, because these produce but temporary loss of pain conduction. In painful states due to malignancy in which loss of motor function is of little moment, alcohol injections of the nerves or neurectomy is indicated. In cases of recurrent mammary carcinoma with great swelling and edema of the upper extremity, the patient usually has to carry the involved arm almost as a foreign body. Pain and swelling are so

great that movement is practically impossible. Under such circumstances permanent block of the brachial plexus is indicated either by alcohol injection or by nerve resection. Nerve-block of the posterior sensory spinal nerve roots or intercostal nerves is frequently necessary as an adjunct to brachial plexus block because of metastasis into the tissues of the chest.

In thorax operations injection of intercostal nerves is done at the lateral margin of the erector spinæ muscles near the angle of the ribs rather than close to the spinal column. On account of the many injections necessary when all the intercostal nerves are blocked, it is better to mark out the points of attack first, and these are later connected by a line of infiltration reaching from the first to the twelfth rib. The patient is in a sitting position with the spine flexed and the shoulder on the affected side carried forward. The nerve-block is now done by introducing the hollow needle just inside the infiltrated area about on a level with the spinous process of the first dorsal vertebra. The point is carried downward until the resistance caused by its contact with the first rib is felt. The under border of the rib is now sought, and as soon as the point meets no more bony resistance the needle is forced in for the distance of one-half centimeter further and 5 cubic centimeters of solution injected. The same procedure is carried out in the second rib, and so on until the desired area has been blocked off. After fifteen minutes there is analgesia of the ribs, muscles, and pleura from the point of injection posteriorly as far forward as the sternum.

Kuhlenkamp's method of blocking the brachial plexus for the relief of acute and chronic pain in the upper extremity is as follows: The first rib is palpated just above the point where it passes beneath the clavicle. Slightly external to this the pulsation of the subclavian artery may be felt. The hollow needle is introduced just beyond this. If blood appears the needle is carefully withdrawn and introduced more laterally. It is carried downward until the

resistance of the first rib is felt or until the patient feels the referred pain in the arm. The syringe is then attached and 5 to 10 Cc. of one-half-per-cent solution apothesine or novocaine injected. Care should be observed not to use the needle as a lever because of the danger of tearing the subclavian vein. Analgesia appears in about fifteen minutes.

It is not necessary with the use of novocaine or apothesine to inject the nerve sheath, although this is desirable because these agents are diffusible, while with quinine and urea or alcohol it is necessary to inject the nerve sheath. It is therefore recommended that the plexus be exposed by incision under local anesthesia, when permanent analgesia is required for the relief of pain due to malignancy. With the plexus exposed either alcohol injection of the cords or section should be done.

Dupuytren's Contracture of the Fingers.

From a study of the material of the Surgical Hospital of Helsingfors for the years 1888 to 1920 KROGIUS (*Surgery, Gynecology and Obstetrics*, September, 1921) came to conclusions somewhat different from those generally accepted. Among his 22 patients he found the condition beginning in the second decade of life in two, in the third decade in six, in the fifth decade in four, and after the fifth decade in six. Eighteen of the patients were males, and four were females. Three of the latter were young girls, in whom the condition was bilateral.

Krogius has discovered one family in which a man with Dupuytren's contracture had 15 descendants with the same condition. Kajava found flexor brevis muscles of the hand in mammals, a fact which suggested to the author that contraction of the palmar fascia might be due to degenerated remains of anlagen of such muscles. According to Kajava, these muscles are present more on the radial side in the lower mammals, but in the higher mammals they are found exclusively in the fifth or the

fourth and fifth fingers. Graefenberg found in a human embryo the anlage of such a flexor brevis muscle which later blended with that of the flexor digitorum sublimis.

The palmaris brevis muscle, which is innervated by the ulnar nerve, arises, according to Kajava, from remnants of these flexor brevis muscles of the hand. In histologic specimens of palmar fascia of the new-born Krogius found in the connective tissue islands of striated muscle tissue which evidently change later into connective tissue.

The palmaris brevis is inserted by means of tendon fibers into the skin; similar fibers pass from the palmar fascia to the skin.

Krogius examined 13 specimens of Dupuytren's contraction microscopically. In none of them was there any small-cell infiltration or sign of inflammation. In old cases he noted only connective tissue poor in cells. The latter were arranged like those in the connective-tissue cords of the sternocleidomastoid in wryneck. In recent cases he found tissue rich in cells with large nuclei. In specimens of different ages it can readily be seen how the tissue becomes poorer in cells as it grows older and the connective tissue bands become denser.

Krogius believes that the tissue rich in cells is embryonic, fundamental tissue which normally would have formed muscle or tendon tissue. In his opinion the only cause of Dupuytren's contraction is an embryonic anlage.

In contrast with this study, and by chance supplementary to it, BYFORD (*Medical Record*, Sept. 17, 1921) observes that the treatment is purely surgical. X-ray, fibrolysin, ionization, and the iodides have all been tried without result. Dupuytren dissected out the fascia and involved skin, allowing the wound to heal by granulation. Adams was an exponent of subcutaneous division of the bands, followed by splinting, for a long period of time. Aseptic surgery has caused this method to be abandoned, and the open operation with dissection of the palmar fascia from the skin and from

the underlying structures is generally performed. This is usually followed by splints, constantly in application for one month, intermittently for another month, and at night for from six to eight months.

Hutchinson in his Hunterian address in 1917 offered a somewhat more complicated but better treatment. He believes that the long-continued splinting results in frequent stiff joints and recurrence of the contraction. He makes a palmar incision and dissects out the fascia. If the case is recent, no further surgical procedure is necessary, and the fingers after a few days, a week at the most, are moved passively and soon actively. Except during the first few days, no splints are used.

In operating on these hands the surgeon must be sure that the contraction is stationary. That long splinting would cause a stiffness of the joints is not improbable, but that it would cause a recurrence of the contraction does not seem reasonable. To

insure against a second hypertrophy and contraction of the fascia, a thorough examination should be made and all sources of infection removed. A careful measurement of the contraction compared with a second measurement six months later will indicate whether or not the condition has become stationary. If it has been stationary for six months after the removal of all infected tissues, the probability of a second contraction is small.

In conclusion the author believes that Dupuytren's contraction is frequently associated with and closely allied to rheumatism.

It is probably due to bacterial action at some point other than the palmar fascia.

The most common site of this infection is in the teeth.

All foci of infection should be removed to prevent progression of the contraction.

A period of six months should elapse between the removal of these foci and the treatment of the contraction itself.

Reviews

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., LL.D., assisted by L. F. Appleman, M.D. Volume III, September, 1921. Lea & Febiger, Philadelphia, 1921.

The present issue of *Progressive Medicine*, which should have appeared in September, has been delayed owing to a printers' strike. It contains, as have the September issues in previous years, articles covering the literature on Obstetrics during the past twelve months by Edward P. Davis, Professor of Obstetrics in the Jefferson Medical College; an article on Diseases of the Thorax and its Viscera, including the Heart, Lungs, and Blood Vessels, by O. H. Perry Pepper, Assistant Professor of Medicine in the University of Pennsylvania; a third on Dermatology and

Syphilis, by Jay F. Schamberg, Professor of Dermatology and Syphilology in the Post-Graduate School of the University of Pennsylvania; and one upon Diseases of the Nervous System, by William G. Spiller, Professor of Neurology in the same institution.

The reputation of all of these contributors is a sufficient guarantee of the adequacy with which they have summarized the various departments under their care.

THE SPLEEN AND SOME OF ITS DISEASES. By Sir Berkeley Moynihan. W. B. Saunders Company, Philadelphia, 1921. Price \$5.

This volume, printed in large type with ample spacing, contains 129 pages and 13 full-page diagrams. It represents the Brad-

shaw Lecture before the Royal College of Surgeons of England for 1920, and provides in concrete form a large amount of valuable information, some of it based upon the author's own experience, with copious quotations from others who have studied diseases of the spleen both from the medical and surgical aspect. By means of the full-page diagrams to which we have referred, the author attempts to reveal to the eye almost at a single glance the chief lesions which occur in the different organs in association with splenic abnormalities.

Naturally the information that is contained in the book leans strongly to the surgical aspect of the subject debated. So skilful a surgeon as Sir Berkeley is prone to speak too enthusiastically in regard to surgical measures for the relief of grave conditions which are often fatal, but we think that we are correct in the statement that in the present volume, while fully recognizing what surgery can do, he does not hesitate to point out that under numerous conditions surgical interference is contraindicated. The book is one which should be in the hands of every physician and surgeon who is interested in diseases of the organs closely associated with the blood-making and blood-breaking organs of the body.

A TEXT-BOOK OF SURGICAL ANATOMY. By William Francis Campbell, M.D., F.A.C.S. Third edition, revised. W. B. Saunders Company, Philadelphia, 1921. Price \$6.

This very handsome volume, printed upon heavy paper and illustrated by no less than 325 original illustrations, is a book which we feel confident will be welcomed in its third edition even more enthusiastically than when the first and second editions appeared. The book is remarkable in the clearness of its statements and for the excellence of its pictures, which are so skilfully drawn that they really present to the eye of the reader the pathological conditions which exist or the anatomical facts with which it is essential that the surgeon and physician shall be familiar. In some instances the picture is that of a normal human body, or part of a

body, except at the point which is under discussion where the muscles, nerves, bones and lymphatics or joints are exposed to give the physician a clear conception of what he will find after his dissection is made. Interesting illustrations of the thoracic and abdominal contents not only from before backward but from backward forward are also included.

There are not many books written by a surgeon that appeal not only to his colleagues in his particular line of work, but to medical men as well. This is a book which fits the needs of both types of practitioners even though the physician may not practice surgery.

Although the physician may be too busy to read the text through and through, the illustrations which appear on almost every page will, at a glance, refresh his memory as to anatomic relations and positions in a most efficient manner. We have rarely seen a book in which the illustrations seem to us so adequate, so complete, and so clear, even as to minute detail, and yet at the same time not diagrammatic but truly representative of natural conditions.

A TREATISE ON DISEASES OF THE SKIN FOR ADVANCED STUDENTS AND PRACTITIONERS. By Henry W. Stelwagon, M.D., Ph.D. Ninth edition, with the assistance of Henry Kennedy Gaskill, M.D. W. B. Saunders Company, Philadelphia, 1921. Price \$10.

When it is recalled that it is just twenty years since the first edition of Dr. Stelwagon's book appeared, and, in addition, that since that time it has been frequently revised and reprinted, it is evident that notwithstanding its exhaustive character it must have been appreciated by a very large number of physicians in general practice as well as by that comparatively limited number of men who are known as dermatologists. The sudden death of Dr. Stelwagon a few years ago necessitated the addition of Dr. Gaskill to the authorship in order that this ninth edition might be brought up to date, and he has succeeded admirably in carrying out the ideas of his friend and former teacher.

It will be recalled that the book has always been characterized by profuse illustrations. The present edition contains 401 illustrations in the text and half-tone plates. Many books which have appeared upon diseases of the skin have been good as to their text, but poor as to their illustrations, particularly when an attempt was made to use colors. In this book the clearness of the illustrations is remarkable in their resemblance to life. Doubtless this fact has been influential in making the book popular in previous editions, because by a glance with the eye as much can be obtained for diagnosis as by reading pages of text.

Originally written by a master of his subject, the book is well worthy in the future of the support which it has received in the past, the more so as the complete bibliography which appears from page to page has been kept up to date. The exhaustive character of the work may be imagined when we state that, with the index, it contains no less than 1313 pages.

HISTORY OF MEDICINE. With Medical Chronology and Suggestions for Study and Bibliographical Data. By Fielding H. Garrison, M.D. Third edition, revised and enlarged. W. B. Saunders Company, Philadelphia, 1921. Price \$9.

Many years ago we heard the late Professor Alfred Stillé assert that one of the causes for slow advancement in medicine was the fact that its votaries were woefully ignorant of the history of medicine and expended their energies along lines which had at least been partly covered by their predecessors.

That a book devoted to medical history should have reached a third edition in nine years is, we think, a remarkable manifestation of the fact that Stillé's criticism is to some extent at least no longer true, for while this book does not deal especially with the thorough researches which were made by our forefathers and is devoted very largely to a consideration of individuals who, from time to time, have made their mark in various countries, nevertheless in his description of the work that they did, rather than of the men themselves, he points

out the trend of scientific investigation and so prevents the reader from thinking when making a research that he is the wonderful pioneer that his work leads him to believe.

The book, in this new edition, is furnished with an exceedingly copious index and covers nearly 950 pages. It may well be considered a notable tribute on the part of a studious medical man to the literature of our profession.

THE MEDICAL RECORD VISITING LIST AND PHYSICIAN'S DIARY FOR 1922. William Wood & Company, New York, 1921.

This excellent Visiting List is readily put in the coat pocket of the physician. By means of it he can record the visits paid to or by his patients, with records of charges and payments made, obstetrical engagements, general memoranda, etc. The first few pages of the list contain a dose list, approximate equivalents, a calendar for 1922 and for the first six months of 1923, a diagram whereby the duration of pregnancy may be calculated, and other facts to which the physician may turn hurriedly when face to face with an emergency or need of immediate information.

THE PHYSICIAN'S PERFECT CALL LIST AND RECORD, 1922. Thirty-sixth edition. E. G. Swift, Publisher, Detroit, 1921.

This book provides the physician with a simple, practical method of keeping accounts with his patients. As the publisher says, it saves time, simplifies bookkeeping, and prevents losses. The forms for keeping a record of calls have been improved to the point of perfection. A place is provided for an obstetrical record, a record of deaths, a vaccination record, and a record of bills and accounts, together with blanks for various memoranda, monthly summary, etc. There are complete dose tables, an obstetrical table, a table on differential diagnosis of eruptive fevers, and many others, all conveniently arranged and indexed. Handy coat pocket size, with the physician's name embossed in gold.

THE PRACTICE OF UROLOGY. By Charles H. Chetwood, M.D., LL.D., F.A.C.S. Illustrated. Third Edition. William Wood & Company, New York, 1921. Price \$8.

The call for a third edition of Chetwood's book sufficiently attests the favor with which his sound teaching has been received by the profession, nor do we find any changes other than those indicated by newer methods which have stood the test of application in the hands of the expert.

The author has the gift of proportion in that his text is not encumbered either by unnecessary words or details. It is a clear, logical and sequential description of lesions, symptoms, and treatment. There is a brief but excellent chapter upon Embryology, followed by others on Diagnosis. Thereafter the various abnormalities and infections are taken up in systematic order. There is a final brief section on Syphilis.

A book to be warmly commended to the general practitioner, who would have a means of ready reference in cases lying within the domain of urology that may present themselves for treatment.

INFECTIONS OF THE HAND. By Allen B. Kanavel, M.D. Fourth Edition, thoroughly revised. Illustrated. Lea & Febiger, Philadelphia and New York, 1921. Price \$5.50, cloth.

There are few surgical monographs which have had a wider reaching and beneficent

effect upon both surgeons and patients than Kanavel's first edition of *Infections of the Hand*. This common and inadequately treated, crippling accident is set forth as to etiology and progress, prevention and treatment in such wise that his pronouncements have been regarded as authoritative and have been followed by all intelligent surgeons. The call for a fourth edition attests to this fact, and is welcomed by the profession in that it incorporates the knowledge gained during the war bearing upon gas bacillus, the streptococcus infections, and enables the author to add a chapter upon restoration of function in infected hands.

The arrangement of the book is as before—indeed, it could not be improved upon. It sets forth facts needful to a clear understanding upon which must be based proper surgical procedure. The author in his preface gives warning as to care in the diagnosis and treatment of tenosynovitis, and states that an increasing experience has demonstrated that with careful and intelligently directed treatment, hands suffering even from this dreaded complication may be restored to complete function.

By the house surgeon, general practitioners, industrial surgeons, and indeed by all who practice the healing art, the facts set forth by Kanavel should be known and applied.

Notes and Queries

An Error in the Dose of Arsphenamine.

Our attention has been called to the fact that in the November number of the *THERAPEUTIC GAZETTE* (p. 818), in a synopsis of Dr. Guy's paper on "A Valuable Method of Treatment in Selected Cases of Syphilis," the dose of arsphenamine is given as 5 grams, when, of course, 0.5 gram is meant. The correct dose is given in the context, however. The error arose through the original article making the same mistake.

Freight Rates and the Farmers.

Deere & Co., of Moline, Illinois, one of the oldest and most reputable concerns manufacturing agricultural implements, have copies of a letter received by them from a farmer living in the neighborhood of Culbertson, Nebraska, and of their reply thereto, which set out graphically present relations between the prices of farm products, prices of manufactured goods and transportation charges, and the effect of these abnormal relations upon business.

We have not the space to give the letter in full, but the following extract from the farmer's letter gives the gist of it. He says:

I need a wagon and my dealer wants the price of 650 bushels of corn; the same wagon I could buy with 200 bushels of corn before the war. The harness man wants the price of a wagon-load of hides for a No. 1 harness. I simply cannot see my way clear to buy wagon, harness or anything else that I can possibly manage to get along without.

Deere & Company make a lengthy and detailed reply, in which they first tell of the rise in the price of wagon stock in recent years due to the depletion of our forests, a factor of great general interest, but for which no immediate remedy is possible. They then go into the effect of increased freight charges, as follows:

Our present price, F. O. B. Moline, on a farm wagon, is 100 per cent higher than our price of 1914. At this price we are selling this wagon at approximately 20 per cent less than our cost. The cost to you at Culbertson, Nebraska, however, does not bear the same relation to the pre-war price, for the reason that in 1914 the freight on a farm wagon from Moline to Culbertson was \$1.37 a hundred; the present rate, including the war tax, is \$2.32.

A farm wagon weighs 1200 pounds. The difference in freight of 95 cents per hundred makes the transportation on this wagon alone cost \$11.40 more than it did before the war. The increased transportation costs upon the materials that go into the wagon are even greater than this amount.

When you come to pay for this wagon through the sale of corn in the Chicago market, you have a still greater disadvantage, due to the fact that corn has declined since 1914. The freight on corn from Culbertson to Chicago in 1914 was 24½ cents a hundred, or approximately 14 cents a bushel; to-day, with the 3-per-cent war tax included, it is 47 cents a hundred, or approximately 26 cents per bushel, so that you pay 12 cents a bushel more to get your corn to Chicago than you did in 1914.

You state that it requires 650 bushels of corn to buy a wagon to-day. At 12 cents a bushel increased freight this means that you are paying the railroads \$78.00 more transportation on the corn necessary to buy this wagon, therefore your increased contribution to the railroad company in getting this wagon out there and shipping corn enough to Chicago to pay for it, is \$89.40.

You can well see from this that it is absolutely impossible for any of us to get back to a normal basis of prices until the cost of transportation is very materially reduced. You ask us when con-

ditions will change; we tell you, when transportation costs are gotten back upon a reasonable basis. The great difficulty in getting this adjustment now is the expense the railroads are put to for labor; for example, here in this community, while the going rate of labor is 30 cents an hour, at the Rock Island shops 43 cents per hour is being paid for eight hours a day and time-and-a-half for overtime, with the proviso that if more than one hour's overtime is worked, even though it be ten minutes, five hours' additional compensation is charged. Locomotive engineers are getting from \$3500 to \$5000 a year. A good deal the same condition obtains in our coal mines.

We all must work, through our congressmen and through a united public sentiment, to secure a readjustment of these railroad and mining costs before any of us can hope to resume business in a normal way. As far as we here are concerned, we have already made substantial reductions in our prices and expect to continue to do so in future as reduced costs of production permit. We are continually operating at a very substantial loss. The business world, outside of transportation and mining, has gone as far as it can until it gets relief through these channels.

The character of some of the rules and regulations may be judged by the following extract from a recent speech by Governor Henry Allen of Kansas. He was discussing the "make work" policy so often pursued by the labor unions, and referring to the great increase of employees on the railroads under government management. He said:

Recently I examined the new regulation of crafts in the railway business. One sample is sufficient to show the extraordinary effect that has followed the illogical expansion of the personnel. This typical case relates to the removing of a nozzle tip from the front end of a locomotive. Mechanically it is as simple an operation as the unhitching of a team of mules, yet here is the elaborate provision of the craft's regulation for performing this task.

It is necessary to send for a boiler maker and his helper to open the door of the boiler, because that's a boiler maker's job. Then you must send for a pipe man and his helper to remove the blower pipe, because that is a pipe man's job. Then you must send for a machinist and his helper to remove the nozzle tip, because that is a machinist's job. Thus they have used three master mechanics and three helpers to perform a simple task which in the prewar days was performed by a handy man around the place who was called a helper. Has it brought prosperity to the railroad men? More railroad men are out of employment in the United States to-day than at any other time since the administration of Grover Cleveland. The doctrine of doing as little as you can for as much as you can get has killed the goose that lays the industrial egg.



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